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Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

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STEVEN PINKER

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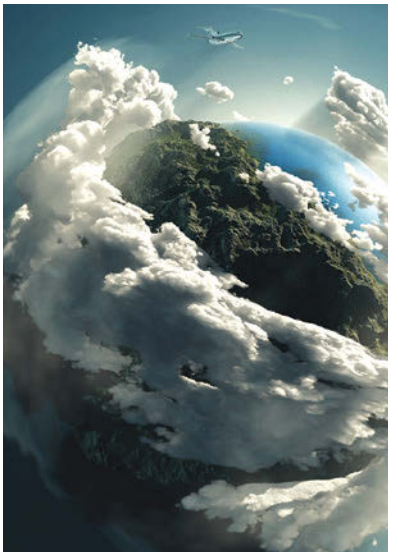

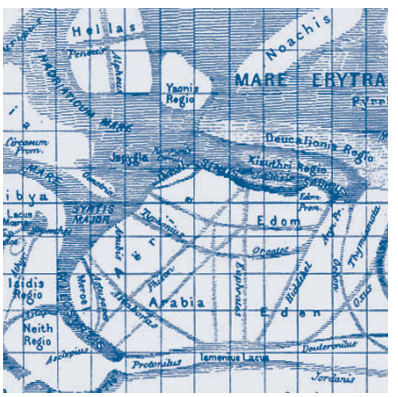

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[FROM THE EDITOR

Why We Can't Acknowledge Progress

I grew up in the 1950s when, for the most part, people seemed optimistic and positive about the world (if we didn't blow ourselves up with atomic bombs). All things seemed possible. Today, in stark contrast, we seem immersed in a sour milieu in which many think the world is worse than ever and things are going to hell. You can always find abundant examples to support that view (or any other view), but what do the data show?

In his new book *Enlightenment Now*, Steven Pinker not only strongly defends science, humanism, and the ideals of the Enlightenment—ideals we strongly support—but also excoriates educated people for their consistent negativism and pessimism. In fact, in an extended excerpt titled "Progressophobia" that we publish in this issue, he contends that intellectuals hate the very idea of progress. If so, is that perhaps because if things are getting better, we fear that our various efforts to improve the world lose their power? That's part of it. But Pinker shows that our current sour view comes primarily from a system of psychological biases and mental bugs that cause us to accentuate the negative and downplay the positive. Couple that with natural journalistic tendencies to emphasize bad news over good (not news)—and a demonstrated worsening trend in that regard—and we have a clear recipe for seeing things through ever-darkening glasses. And that prevents us from noticing and acknowledging widespread improvements in human conditions that are indeed happening globally. In our article, Pinker responds to critics of his previous book, *The Better Angels of Our Nature,* in which he persuasively demonstrated that worldwide and in historical perspective violence has gone down. In his new book he demonstrates, with detailed and credible data, that historically and globally we have also seen long-term improvements in life, health, sustenance, wealth, inequality, the environment, peace, safety, terrorism, democracy, equal rights, knowledge, quality of life, and happiness.

If that seems counterintuitive to you, you are not alone. Most educated people find this difficult to believe. Our blinders are on. But scientific skeptics should go where the evidence leads. Pinker argues the case eloquently and, I think, effectively, drawing on both the demographic data and our improved understanding of human biases that get in our way of seeing the truth. I urge you to follow his reasoning carefully. Pinker is one of our most distinguished public intellectuals and a long-time fellow of our Committee for Skeptical Inquiry. You may disagree with him, but you better bring better data with you to the fight.

Speaking of how our preconceptions can influence our view of things, psychologist Matthew J. Sharps returns to our pages with his fresh take on "Percival Lowell and the Canals of Mars." The story of how Lowell (no fool) thought he saw canals on Mars may seem laughable to us today, but it seemed very real at the time. Sharps describes the psychological and sociocognitive processes, among some very brilliant people, that led to what was, after all, a grand delusion. No one is immune, and that's the central lesson for us today.

—Kendrick Frazier

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'Ballistic Missile Threat Inbound … This is Not a Drill': The Formidable Threat of False Alarms

Robert Bartholomew

At approximately 8:07 AM on January 13, 2018, the state of Hawaii's Emergency Management Agency in Honolulu sent out a frightening alert on TV, radio, and cell phones across all of Hawaii: "BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL." A second alert saying the original alert was a false alarm was transmitted thirty-eight minutes after the initial broadcast. The episode transpired during a period of heightened tension between the United States and North Korea, and it generated widespread fear and anxiety. A member of the state's House of Representatives, Matthew LoPresti, told CNN: "I was sitting in the bathtub with my children, saying our prayers" (Cohen 2018). The *New York Times* reported that "People flocked to shelters, crowding highways in scenes of terror and helplessness" (Nagourney et al. 2018).

Since the early twentieth century, there have been numerous false alarms of attacks, broadcast either intentionally or by accident. On the evening of October 30, 1938, a radio drama about a Martian invasion caused widespread fear after being broadcast on 151 syndicated stations across the United States and Canada. Princeton University psychologist Hadley Cantril estimated that upward of 1.7 million listeners were frightened, while a relatively small number panicked and attempted to flee the epicenter of the fictitious attack: Grovers Mill, New Jersey. The impact was most disruptive near "ground zero." The next day, the city manager for Trenton, New Jersey, Paul Morton, told the *Trenton Evening Times* that the deluge of phone calls "completely crippled communication facilities" for the city's police department for three hours.

Several similar realistic radio broadcasts with localized storylines have caused widespread alarm. On November 12, 1944, panic erupted across Chile after a series of "news flashes" about invading Martians (*Newsweek*, November 27, 1944, p. 89). On February 12, 1949, a broadcast in Ecuador triggered rioting. A *New York Times* reporter was in Quito and wrote that the drama "drove most of the population of Quito into the streets to escape the 'gas raids' from Mars." Once the fictitious nature of the broadcast was realized, a mob set the radio station alight, killing twenty and injuring fifteen (*New York Times*, February 14, 1949, p. 1). Regional scares prompted by localized radio adaptations of the Welles broadcast have occurred in Buffalo, New York, in 1968; Providence, Rhode Island, in 1974; and Lisbon, Portugal, in 1998 (Levine 1999).

EMERGENCY ALERTS
Emergency Alert
BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL.
Settings

Since the early twentieth century, there have been numerous false alarms of attacks, broadcast either intentionally or by accident.

On the night of March 20, 1983, NBC broadcast the TV movie *Special Bulletin*, about terrorists threatening to detonate a nuclear bomb on a tugboat in South Carolina's Charleston Harbor. In many markets, hundreds of calls were made to police and local affiliates inquiring about the authenticity of the program, which was realistic and won several Emmy Awards (*The Post*, Frederick, MD, March 22, 1983, p. B14). On January 29, 1991, an employee at radio station KSHE-FM in Crestwood, Missouri, who was unhappy with the U.S. involvement in the Persian Gulf War, aired the following announcement: "Attention, attention. This is an official civil defense warning. This is not a test. The United States is under nuclear attack." The station's phone lines lit up with calls from worried listeners. While a major panic did not occur, the Federal Communications Commission stated that the broadcast "had the potential to create widespread panic." It fined the station $25,000. (See Levine 1999.)

In addition to generating fear, havoc, disruptions to emergency services, and wasted resources, false alarms can exacerbate an array of health conditions, from anxiety disorders to cardiac problems. It can also prompt people to behave rashly, for example driving too fast, placing lives at risk. Then there is the Cry Wolf Effect: in the event of a real attack, subsequent warnings may be taken lightly or ignored altogether. On December 6, 1941, Orson Welles was giving a live poetry reading on national radio. Suddenly, the feed was interrupted by a special bulletin about the Japanese attack on Pearl Harbor. Many listeners initially expressed skepticism, suspicious of the coincidence.

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Barry Williams, Pioneering Australian Skeptic, Dies at Seventy-Nine

Barry Williams, founder of the Australian Skeptics, has died. Tim Mendham, editor of The Skeptic, *shared his thoughts:*

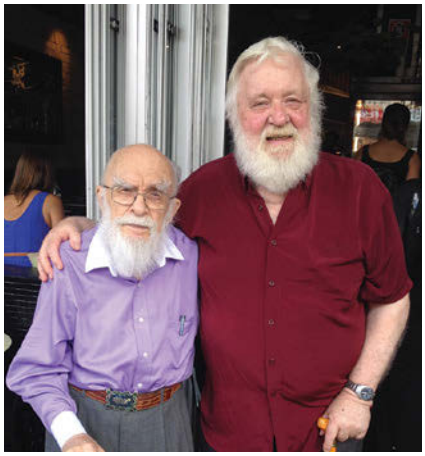
It is with great sadness that we report the news of the passing of Barry Williams, who died on January 20, 2018, at the age of seventy-nine, following a series of heart operations. Barry was intrinsic to the history and development of the skeptical movement in Australia, and for many years he was the face of skepticism in this country. As fellow skeptic Peter Bowditch has said, "We should all remember that we are here because he was there."

Barry was born in Queensland on November 10, 1938. He joined the RAAF and served in various places, including at Butterworth air base in what was then Malaya. While he was a member of the ground crew rather than airborne, he was particularly proud of being the leader of a "parade" bringing back a jet plane that had made an emergency landing on the highway north of Newcastle, NSW, on a long trek back to Williamtown Airforce Base, traffic jam notwithstanding.

In 1980, he watched a TV program on a series of tests of water diviners organized by Dick Smith and James Randi. Dick said there should be an organization established to do such tests on a regular basis, so Barry put his hand up and formed the Sydney branch of what was then the Victorian-based nascent Australian Skeptics. (As a science journalist who had covered some of the exhibitions he organized, he persuaded/cajoled/insisted the author of this piece to join the Sydney committee at its first meeting. It was an offer I could not refuse.)

In 1985, the first Australian Skeptics National Convention was held in Sydney, and the following year the "national office" of the Skeptics moved there, followed by the magazine, *The Skeptic*, the next year. In his capacity as president of the notionally national Australian Skeptics, Barry took up a high media and community profile, which he maintained until his retirement from active skepticism in 2009.

In 1990, he took over editorship of the magazine "just for one issue," which lasted for another eighteen years. He continued to be a contributor to the magazine with articles of whimsy and erudition, contributing to the many hundreds of pieces he wrote during and before his role as editor. In 1995, the Skeptics received a sizeable bequest



Barry Williams and James Randi

from the estate of Stanley David Whalley. With these funds, the organization established the Australian Skeptics Science and Education Foundation (ASSEF) and was able to create the position of executive officer, which Barry took up, relinquishing the presidential chair. (With his skepticism in mind, you can imagine, as Barry put it, "his flabberghastocity on being admitted to hospital on December 20 to find the cardiologist in charge of his case was one Dr. David Whalley." This David Whalley is a distant relative of the other David Whalley whose generosity helped take Australian Skeptics, and Barry with it, into new and dramatic areas. Coincidence? We don't think so.)

Barry was a prodigious reader with a leaning toward science fiction and detective novels. He also had a strong interest in Egyptology and astronomy. But more importantly, he was a cricket tragic to the nth degree—he could turn any conversation around to cricket, regardless of the time, place or topic. He wrote the definitive article on the myth of the number 87, the legendary but totally misplaced nemesis of the Australian cricket team. That article was first published in *The Skeptic* in 1993. (It was reprinted in 2012 and can be found at https://tinyurl.com/y949fyqn.) In 2001 it was selected to be published in a book titled *The Best Ever Australian Sports Writing—a 200 Year Collection*.

Appropriately, when Barry was awarded the first Australian Skeptics Lifetime Achievement Award, the plaque was mounted on a facsimile of the Ashes urn. He was thrilled. Cricket was the answer to the meaning of life, the universe, and everything. That is, when the answer wasn't skepticism.

His height, strong voice, and, shall we say, his more than adequate size, meant he was an imposing figure in any discussion, and he was never shy in confronting the purveyors of woo and the shonks selling any form of pseudoscience and the paranormal. In the days before social media, Barry was ever present on TV, radio, and in the press and was instrumental in the transition of the Skeptics' image from amusing novelty to serious players and activists.

He might have been a curmudgeon at times (a description he would and did approve of), but he also had great enthusiasm and a strong sense of humor and the ridiculous—a jolly Santa with a "bah humbug" never far from his lips. He could probably quote every word of the Goons shows, and he was a mine of information on British comedy. Boredom was never an issue in long conversations with him (and I had many of those). Seeing him with the long lineage of dogs and cats he owned and sometimes found over the years, you realized that he very much had a soft side that came readily into play. Likewise, he was extremely proud of his family and would regularly cite the success of his daughter, Pita, in the legal profession.

One of his last comments during

his recent hospitalization was that he wanted to "ensure he doesn't croak before humiliation of the Poms in the Ashes is complete." He might not have seriously intended to croak, but the Australian test team did manage to fulfil his wish. He would have been very pleased that they had taken such positive notice of his request. To Pita, Roz, Helen, Stephen, Nicholas, Christopher, and the rest of his family and wide circle of friends, our sincere and deepest condolences. Rest in peace, Barry. We'll miss you.

In 1990, he took over editorship of the magazine "just for one issue," which lasted for another eighteen years.

Added Richard Saunders: "It's hard to imagine the skeptical world without Barry Williams. Although he was not one to travel to international conventions, it's safe to say that thousands of skeptics from every corner of the globe knew of Barry, if only from reading *The Skeptic*, which he edited for almost two decades. But for those of us in Australia, he was the face of the Australian Skeptics in the media with countless TV appearances, and the voice of Australian Skeptics for anyone who called the head office. (That office was incidentally a tiny alcove with a computer and phone, just off to the side of his bedroom!) He knew BS when he saw it and had the long experience to know exactly when he did see it. He was the personification of common sense and pragmatism, wrapped in humanity ... and looked like Santa Claus. Australian Skeptics owe him much, and so does the Australian public, whether they know it or not."

Michael Mann Receives AAAS Public Engagement with Science Award

Newly elected CSI Fellow Michael E. Mann has been awarded the 2018 AAAS Public Engagement with Science Award from the American Association for the Advancement of Science.

Mann, a climate scientist and professor of atmospheric sciences at Pennsylvania State University, was recognized for his "tireless efforts to communicate the science of climate change to the media, the public, and policymakers."

His nominator, Susan Hassol, director of the nonprofit group Climate Communication, wrote that in one year "Mann has done more to engage with the public on science than most active scientist-communicators do in an entire career. There is no scientist reaching greater numbers of people with such depth of communication as Michael Mann."

The award, which includes a plaque and a monetary prize of $5,000, recognizes scientists who make outstanding contributions to the "popularization of science." It was presented at the AAAS Annual Meeting in Austin, Texas, February 17, 2018.

Bertha Vazquez Given NABT Evolution Education Award

Bertha Vazquez, director of the Teacher Institute for Evolutionary Science (TIES) and a middle school science teacher in Miami-Dade County Public Schools for twenty-seven years, has received the 2017 Evolution Education Award from the National Association of Biology Teachers.

The award recognizes her work both as an outstanding science teacher and as the director of the Richard Dawkins Foundation's TIES. Since the merger of the Dawkins Foundation with the Center for Inquiry (CFI), TIES is a part of CFI. Vazquez is a tireless campaigner for better ways to educate young people about evolution and as head of TIES conducts teaching workshops around the country. She was named the Miami-Dade Science Teacher of the Year in 1997, 2008, and 2017.

Why Did We Call Prince Charles Foolish and Immoral?

EDZARD ERNST

I was recently reported for calling Britain's heir to the throne "foolish and immoral."[1] The quote happens to be correct; it comes from our new book titled *More Good Than Harm? The Moral Maze of Complementary and Alternative Medicine*.[2] In it, the ethicist Kevin Smith and I discuss the many ethical issues around alternative medicine and essentially conclude that it is not possible to practice alternative medicine ethically.

The exact quote from our book relates to Charles's promotion in 2004 of something called the Gerson diet for cancer:

> Despite the fact that they have attained their high positions merely through accidents of birth, monarchs undoubtedly have a good deal of influence over their "subjects." It is therefore inescapable that many cancer patients will have been given false hope by the utterances of Prince Charles. Accordingly, we consider his public support for unproven cancer treatments to be both foolish and immoral.

Charles's foolishness in respect to the promotion of quackery has, in my opinion, been demonstrated multiple times.[3] His love affair with all things alternative started early in his life. As a teenager, Charles was taken by Laurence van der Post on a journey of "spiritual discovery" into the wilderness of northern Kenya. The fantasist van der Post wanted to attune Charles to the vitalistic ideas of Carl Jung, and it clearly is this belief in vitalism that provides the link to alternative medicine.

Throughout the 1980s, Charles lobbied for the statutory regulation of chiropractors and osteopaths in the United Kingdom. In 1993, this finally became reality. In 1982, Charles was elected as president of the British Medical Association (BMA). In his inauguration speech, the prince lectured the medics:

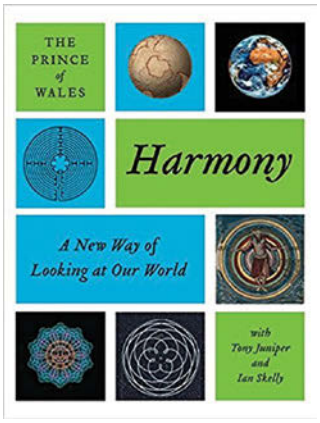
> Through the centuries healing has been practised by folk healers who are guided by traditional wisdom which sees illness as a disorder of the whole person, involving not only the patient's body, but his mind, his self-image, his dependence on the physical and social environment, as well as his relation to the cosmos.

In 1993, Charles founded his Foundation for Integrated Health (FIH), which was closed in 2010 amid allegations of money laundering and fraud. In 2005, Charles commissioned the

PA Images / Alamy Stock Photo

Charles's foolishness in respect to the promotion of quackery has, in my opinion, been demonstrated multiple times.

"Smallwood Report,"[4] which stated that up to £480 million ($675 million) could be saved if one in ten family doctors offered homeopathy as an "alternative" to standard asthma treatments and that savings of up to £3.5 billion ($5 billion) could be achieved by offering spinal manipulation rather than drugs to people with back pain. To avert such nonsense from being implemented, I had publicly commented on this report before its publication. Prince Charles's first private secretary therefore asked the vice chancellor of my university to investigate my alleged indiscretion; even



Charles's 2010 book *Harmony* is full of praise for even the most absurd forms of alternative therapies and bogus diagnostic tests.

though I was found to be not guilty of any wrong-doing, all local support at Exeter stopped, which eventually led to my early retirement.

In a 2006 speech to the general assembly of the World Health Organization, Charles urged the delegates to globally integrate conventional and alternative medicine into the mainstream. In 2009, the prince told our Secretary of Health that "despite waves of invective over the years from parts of the medical and scientific establishment … I cannot bear people suffering unnecessarily when a complementary approach could make a real difference" and opposed "large and threatened cuts" in the funding of homeopathic hospitals. He also complained that referrals to the Royal London Homeopathic Hospital were sabotaged by "what seems to amount to a recent anti-homeopathic campaign" despite "the fact that these homeopathic hospitals deal with many patients with real health problems who otherwise would require treatment elsewhere, often at greater expense." In 2010, Charles even stated that he was proud to be perceived as "an enemy of the enlightenment." In the same year, former fellows of the FIH launched a new organization, the College of Medicine and Integrated Health, aimed at supporting the use of alternative treatments on the National Health Service. One director of the college is Michael Dixon, formerly medical director of the FIH.[5] Charles's 2010 book *Harmony* is full of praise for even the most absurd forms of alternative therapies and bogus diagnostic tests.[6]

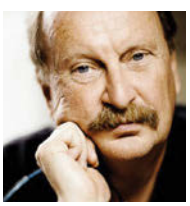
In 2011, Charles launched his Duchy Herbals Detox Tincture, which I publicly called the "Dodgy Originals Detox Tincture."[7] In 2015, *The Guardian* obtained the infamous "black spider memos," which revealed that Charles had repeatedly lobbied politicians in favor of alternative medicine. In 2016, speaking at a global leaders' summit on antimicrobial resistance, Charles explained that he had switched to organic farming on his estates because of the growing threat from antibiotic resistance and now treats his cattle with homeopathic remedies rather than conventional medication.

So, is it unfair to call Charles "foolish and immoral"? The late Christopher Hitchens would probably have denied this question:

> So this is where all the vapid talk about the "soul" of the universe is actually headed. Once the hard-won principles of reason and science have been discredited, the world will not pass into the hands of credulous herbivores who keep crystals by their sides and swoon over the poems of Khalil Gibran. The "vacuum" will be invaded instead by determined fundamentalists of every stripe who already know the truth by means of revelation and who actually seek real and serious power in the here and now. One thinks of the painstaking, cloud-dispelling labor of British scientists from Isaac Newton to Joseph Priestley to Charles Darwin to Ernest Rutherford to Alan Turing and Francis Crick, much of it built upon the shoulders of Galileo and Copernicus, only to see it casually slandered by a moral and intellectual weakling from the usurping House of Hanover. An awful embarrassment awaits the British if they do not declare for a republic based on verifiable laws and principles, both political and scientific.[8]

Notes

1. www.telegraph.co.uk/science/2018/01/17/professor-reignites-war-prince-charles-homeopathy-support/
2. https://www.amazon.co.uk/More-Harm-than-Good-Complementary-ebook/dp/B078ZQXQNP/
3. edzardernst.com/2017/11/happy-birthday-your-royal-highness/
4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1821425/
5. https://sciencebasedmedicine.org/dr-michael-dixon-a-pyromaniac-in-a-field-of-integrative-straw-men/
6. https://www.amazon.co.uk/Harmony-New-Way-Looking-World/dp/0007348037/ref=sr_1_1?ie=UTF8&qid=1384092482&sr=8-1&keywords=harmony+by+prince+charles
7. http://www.dailymail.co.uk/health/article-1165495/Dodgy-Originals-This-remedy-Prince-Charless-company-like-liquid-sunshine.html
8. https://www.goodreads.com/quotes/tag/british-royal-family



Edzard Ernst, MD, PhD, is emeritus professor, University of Exeter, United Kingdom. His latest book is *More Good Than Harm? The Moral Maze of Complementary and Alternative Medicine* (with Kevin Smith). He is a Committee for Skeptical Inquiry fellow.

Flat-Earth Anxieties Reflect Misplaced Priorities

CRAIG A. FOSTER

Somehow, some way, the flat-earth movement continues to make waves. Legitimate news sources and social media platforms have distributed a variety of interesting flat-earth reports over the past year. This news has included an international flat-earth conference in Raleigh, North Carolina; a rapper and apparent flat-earther named B.o.B. who started a fundraising campaign to purchase satellites; and a self-taught rocket scientist who planned to launch himself from a converted motorhome to obtain evidence that the earth is flat.

Stories such as these seem to irritate many of those who recognize that the earth is actually shaped like a ball—an imperfect ball, but still clearly a ball. These "round earthers" demonstrate their frustration by commenting on the absurdity of the flat-earth movement. They sometimes describe flat earthers in pejorative ways. They provide arguments intended to stop the rotational momentum of the flat-earth movement. I even recall a Facebook comment suggesting that round earthers should secretly infiltrate flat-earth meetings to undermine their misshapen belief system. I have to ask—and I truly mean this kindly—why does anybody care?

To be fair, I semi-understand. One hopes that the flat-earth movement represents a low point in contemporary susceptibility to pseudoscience, and it is disappointing to see people promote a claim that is so dramatically misaligned with science and reason. Nevertheless, the potential and kinetic energy devoted to counter the flat-earth movement is wasteful and misguided. It reveals a broad

naiveté about which forms of pseudoscience have real gravitas. Specifically, I don't understand why anybody would worry about the flat-earth gnat while facing the climate change mammoth.

First, the possible expansion of the flat-earth sphere of influence seems to present few, if any, directly destructive consequences. Passenger planes will still land in their intended locations. Skiing enthusiasts will still slide downhill. The major consequence of the flat-earth movement seems to be indirect. That is, if people can be convinced that the earth is flat, what other nonsense might they also believe? In contrast, climate change denial is at best the cause of widespread harm and at worst a likely candidate to snuff the human race. Some people use scientists' inability to agree on the consequences of climate change as justification for inaction, but this approach is obviously foolish. It is akin to allowing hooligans to continue vandalizing your home because you can't determine exactly how much the damage will cost.

Second, the flat-earth movement is hardly likely to reach levels achieved by climate change denial. The problems underlying the flat-earth movement are easily identified; arguments referencing ice walls, international conspiracies, and biblical verses (e.g., Job 38:13) sound unconvincing. The flat-earth movement also has limited financial backing (at least it seems that way judging by B.o.B.'s GoFundMe campaign). Climate change denial is much tougher to obstruct. Climate change denial does not require belief. It only requires neglect. Humans frequently neglect problems; just consider the omnipresence of unhealthy diets and credit card debt. Humans are clearly willing to incur greater costs tomorrow to avoid more efficient solutions today. Neglect is particularly easy in the climate change domain because humans cannot sense directly the slow rise in average temperature, and powerful self-interested groups cultivate a belief that climate change is not truly dangerous.

Furthermore, encouraging people to neglect climate change warnings plays on their psychological vulnerabilities. Humans have a well-known tendency to view the future with unrealistic optimism. For instance, they typically believe that their marriages will last, despite the observable frequency of divorce. Humans also have a particular dislike for loss. They would rather avoid losing $1,000 than gain $1,000. This makes it difficult for people to admit that their current lifestyle is not compatible with long-term climate health. Together, these well-known psychological biases make it easy for people to bet that climate change is not happening—and if it is, the consequences couldn't be that dire.

The potential and kinetic energy devoted to counter the flat-earth movement is wasteful and misguided. It reveals a broad naiveté about which forms of pseudoscience have real gravitas.

Climate change denial is much more than any run-of-the-mill willingness to cook up some woo. Climate change denial impedes our ability to pass the ultimate test of whether humans can work together to solve collective problems. Climate change provides a direct threat to humanity. The causes of climate change are known, and the scientific solution is sufficiently clear: decrease the production of greenhouse gasses. Humans can create that solution if they are willing to (a) trust the scientific community and (b) do their part to avoid jeopardizing friends who live next door and strangers who live halfway around the world. The need to satisfy both of these conditions creates the "multiplicative" rule in probability. Accordingly, if the likelihood of sufficient trust in science is 60 percent and the likelihood of corresponding change is 60 percent, the likelihood of a sufficient response is only 36 percent.

As a social psychology professor who examines pseudoscience, I have pondered whether humans are so flawed that we could allow a challenging but ultimately solvable problem to escalate to a point where it extinguishes the human race. Some days I think so. Humans have achieved incredible things, but they are stubborn about changing their beliefs. This pervasive characteristic is particularly dangerous in the context of climate change. All humans need to do is delay a legitimate solution until we pass some ambiguous tipping point where the problem becomes irreversible. In my opinion, humans are entirely capable of that.

That is why I don't fret about whether people believe that the earth is a disc or a globe—and you shouldn't either. Don't mistake a cup of tepid pseudoscience for a pot of boiling denial. Those who believe in man-made climate change should recognize the importance of this issue and avoid being unfittingly distracted by less important forms of pseudoscience. For those of you who doubt that man-made climate change is a serious issue, I kindly ask you to reconsider. Flat or round, Earth is a truly amazing planet. I don't like playing roulette with it.

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The views expressed in this commentary are his own and do not necessarily reflect official policy or positions of the U.S. Air Force Academy or any part of the government.

A Doctoral Dissertation on a Geocentric Flat Earth

'Zetetic'[1] Astronomy at the University Level

YAËL NAZÉ

On April 1, 2017, Professor Hafedh Ateb, a scientist who founded the Tunisian Astronomical Society, published a post on his Facebook page to denounce a forthcoming PhD thesis (Ateb 2017). Its subject? The geocentric universe with a flat and young Earth. It was not an April Fool's joke.

With a bit of condescension, the astronomical (or more generally the scientific) community on this side of the Atlantic often thinks that geocentrism and young (or flat) Earth are typically American ideas. We generally ignore the regular Eurobarometers[2] revealing that one third of Europeans prefer a geocentric model to a heliocentric one. We also choose to avoid seeing the multitude of YouTube videos in languages other than English explaining at length why the earth is flat or young. Indeed, few of us are doing outreach, and even fewer are tackling or simply encountering pseudosciences.

The Tunisian scandal over the geocentric flat-earth dissertation was totally unexpected, even more so because it did not involve a basketball player or some rapper but rather university people from a science faculty.

The Tunisian scandal was therefore totally unexpected, even more so because it did not involve a basketball player or some rapper but rather university people from a science faculty. Of course, some thought, "Well, you know, that's the Middle East" (usually said, again, with a condescending tone). They forget that medieval astronomy was dominated by Arabic and/or Muslim thinkers, who made several important contributions to the field (for a review, see, e.g., Nazé 2018), and that Tunisia has good universities to this day (and many researchers abroad in prestigious institutions). A second look was thus merited.

The original post by Professor Ateb did not mention the name of the PhD student, the promoter, or the university. After expressing his surprise and sadness, Ateb simply quoted verbatim the conclusion of the manuscript that a favorable wind had brought to his desk. With numerous French spelling mistakes, this conclusion states that the thesis demonstrates, thanks to physical *and religious* arguments, that Earth's surface is stable, central, and flat. The age of the earth, the formation of clouds, and more generally the science of the climate (including the Flood), the speeds of light and sound, as well as the distances and sizes of stars and planets are also examined and revised, with the new values better agreeing with Scriptures. In addition, the stars are mentioned to have three roles: (1) decorating the sky, (2) lapidating the devils, and (3) providing signs to guide the creatures in the terrestrial darkness. In the same vein, the role of the planets is said to be the protection of the sky against devils; they can be thrown toward demons by angels.

Because of Ateb's reputation and the number of his followers, the news spread rapidly. Many local and international media in Arabic, French (e.g., *Jeune Afrique*), and English (e.g., *Gulf News*) quickly related the case and interviewed eminent people to understand how this could have happened in a modern country.

In these articles, the names became public: the student was Mrs. Amira Kharroubi, her promoter professor

Jamel Touir, and their university was that of Sfax. A few days later, the Tunisian Astronomical Society posted a statement calling for better teaching in physics and astronomy, the creation of a space pole in Tunisia, and better monitoring of theses in the country's universities (Kamoun 2017).

Finally, a week after the beginning of the scandal, the TAP press agency announced that the committee overlooking theses in environmental studies at the Sfax University had met and decided to reject the thesis because of severe scientific and ethical shortcomings (MKJ 2017). An ongoing inquiry is also mentioned, recognizing the presence of administrative problems in this case.

This is indeed the most important point. It seems that rejection only occurred because the case was publicized in the media, so one may wonder what would have happened if Professor Ateb had never received the manuscript. Safeguards are supposed to exist, however. For any thesis in Tunisia, the framework (people involved—student, promoter—as well as the subject) must be accepted by a specific committee. This is even more true for the most prestigious universities of the country, such as the one at Sfax. However, the thesis framework had been accepted without problem by the Sfax committee, though the subject was made clear from the start, in the academic year 2011–2012![3] It remains unclear whether this may happen again (or has happened before) and what type of funding was used for this "research" (notably for paying the page charges of the associated publication, see below). The university, the faculty, and the committee haven't responded to (repeated) interview requests.

It is also worth mentioning that the thesis promoter is not totally unknown. On his Scopus record,[4] Touir is quoted to have an h-index of six, with nineteen geological publications (four as first author) since 2004 and seventy-five citations to them. This is not high for a mid-career scientist, but this is sufficient to demonstrate scientific activity, at least in the field of geology. When the scandal broke out, his reaction in the media seemed quite amiss (Touir 2017). He defended the work, claiming to be the subject of a malicious campaign to undermine his reputation and scientific skills, and called on academic freedom and freedom of thought "guaranteed by the Constitution." In passing, he also mentioned that the student basically chose the subject. However, it was clearly an astronomical subject (although he is a specialist in geology), so one may wonder why, as a scientist, he hadn't directed the student to a colleague specialized in these matters. Furthermore, since he was deputy at the National Constituent Assembly from 2011 to 2014 (as a member of a progressive party, Ettakatol), he had little time to actually supervise a thesis back then—again, a good reason to decline and direct the student to a colleague. From the tone of the thesis conclusion, it may be imagined that religion played a role in his decision, but unfortunately, his actual motives will most probably remain private since he doesn't answer interview requests.

It seems that rejection only occurred because the case was publicized in the media, so one may wonder what would have happened if Professor Ateb had never received the manuscript.

While the thesis manuscript itself remains unpublished, Professor Touir directed journalists to a published article[5] (Kharroubi and Touir 2016). Publication occurred in *The International Journal of Science and Technoledge*, a journal unknown to very thorough astronomical databases such as ADS.[6] Its website[7] mentions peer-reviewing (though see below), an impact factor of 1.002 (though the journal doesn't appear in the usual impact factor tools), a small publishing fee, and, tellingly, an editor-in-chief with a diploma in "homeopathy & biochemic." This is not reassuring, but the worst is yet to come. The Kharroubi and Touir paper is centered on the geocentric model, the first step toward flat-earth astronomy (see Parallax 1865, endnote 1). It is written in English but with numerous obvious linguistic mistakes (for example "Lactic Way" rather than "Milky Way" and "NAZA" rather than "NASA"). This is not the main problem, though, as the article is full of *scientific* errors. First, there are several incorrect quotes: for example, the introduction against heliocentrism quotes a few sentences from a book by Indian astrophysicist J.V. Narlikar without providing the context, which actually totally changes the meaning. Second, there are also arguments based on *solved* problems such as the Pioneer anomaly or the "faster-than light" neutrinos from CERN. Third, there are also non-arguments, e.g., heliocentrism is rejected because the Sun has a motion around the center of the galaxy; this is true, but that doesn't mean geocentrism is correct instead—this is a textbook case of false dilemma. Fourth, there are blatant mistakes: in their Figure 1, the heliocentric model has the Moon revolving around the Sun; the text mentions the need for Earth of some "self-power" to change its orbital velocity and a link between that speed and the occurrence of seasons; it also asserts the "fact" that the Sirius parallax was never measured as well as the impossibility in a heliocentric model to have geostationary satellites or meteor showers preferentially seen in the morning, as observed. In addition, there are also the usual kinematic arguments dating back to antiquity and long since rejected. Last, there are a few mentions of observations and to one experiment. Observations are simple ones made by the naked eye (e.g., Moon rises in the

East and sets in the West), without the somewhat detailed measurements or long observations that are required to go beyond the simplest[8] version of geocentrism used here. The (very simple) experiment is about shadows, but in a wrong framework, again reflecting a profound misunderstanding of the geocentric and heliocentric models (sundials would work in both cases, contrary to what is said there). Considering the content of this article, it seems clear that there was no serious peer-review, contrary to the statement on the journal's website. In addition, there is a strong contrast between this article and the geological ones linked to Touir, which are rather standard, demonstrating different levels of vigilance, or a double-standard—a behavior difficult to understand for a scientist. As he recommends reading this article to understand the global quality of his student's work, the unavoidable conclusion is that this work is simply scientifically worthless.

The Kharroubi and Touir paper is written in English but with numerous obvious linguistic mistakes (for example "Lactic Way" rather than "Milky Way" and "NAZA" rather than "NASA"). This is not the main problem, though, as the article is full of *scientific* errors.

Finally, it is also worth examining the reactions of some colleagues to this scandal. Beyond the paternalist and/or ironic ones already mentioned, there were also a few defending Touir, sometimes indirectly. Ghanem Marrakchi (2017) blames social media, stating that science is done in scientific journals not by Internet posts. This is certainly true in general, but without the initial post by Professor Ateb, the thesis would certainly have been defended by now, and a PhD status given for pseudoscientific work. In this case, social networks were actually useful. He also mentioned that science should be judged on published articles. When contacted, Marrakchi mentioned that he had read the 2016 article mentioned above, but he could not judge its content because it was not his field of expertise. In view of the many obvious methodological problems and basic astronomical content (such as the occurrence and cause of seasons), it is doubtful that the article content could not be easily assessed. Besides, if he doesn't consider himself competent on the topic, having a geologist undertaking astronomical research should also appear problematic.

The lesson we may learn from this case, as scientists and skeptics, is this: we should not hesitate to ask and inquire and denounce problems if needed—we should not wait for a good soul to come and act in our place. In particular, supervision committees exist and should be used. This implies that we should examine what our eyes see and not just acknowledge without reading, as is often the case in such committee meetings. However, that doesn't mean actual research on "strange" or "peculiar" subjects should be rejected right away. How would we know without tests that homeopathy works no more than a placebo? As a student, promoter, colleague, or friend, we should perhaps simply always remember to think (critically, of course)!

Notes

1. This subtitle was chosen to recall the abusive use of the word *zetetic* in the infamous founding reference of flat-earth proponents: "Zetetic Astronomy, by Parallax, 1865."

2. http://ec.europa.eucommfrontoffice/publicopinion/index.cfm; see also the recent French poll revealing the presence of 9 percent of Flat-Earth believers (https://jean-jaures.org/nos-productions/le-conspirationnisme-dans-l-opinion-publique-francaise).

3. "The Flat-Geocentric Earth Model: Arguments and Impacts on Climatic and Paleoclimatic Studies," see http://www.theses.rnu.tn/fr/dynamique/fiche.php?id=11590. The "goal" part of this registered theses form is missing, and there is no mention of religion in the title.

4. https://www.scopus.com/authid/detail.uri?origin=resultslist&authorId=6505938715&zone=

5. It is interesting to note that religious arguments are not mentioned at all in this article.

6. http://adsabs.harvard.edu/

7. http://www.theijst.com/

8. There is no epicycle or eccentrics in the models shown in this paper although they were required by astronomers in antiquity to reproduce observations in the framework of geocentric models using circular orbits.

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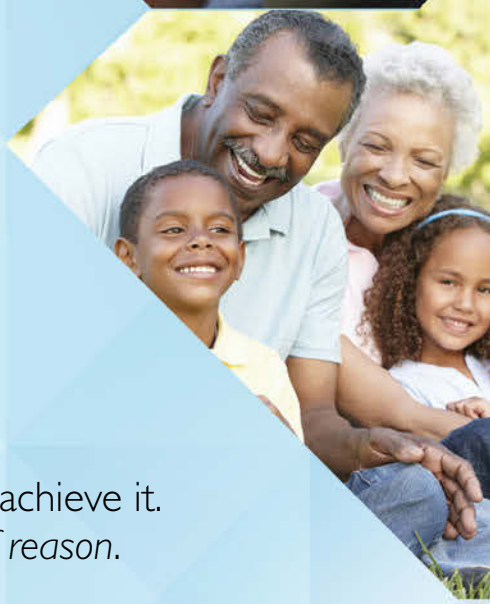

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Joe Nickell, PhD, is CSI's senior research fellow and, among other personas, a skeptical UFOlogist. He is an author or editor of some forty books, including *The UFO Invasion*.

Navy Pilot's 2004 UFO: A Comedy of Errors

The first I heard about a shadowy UFO research program operated by the U.S. Defense Intelligence Agency (DIA) from 2007–2012 was when I was interviewed by *New York Times* reporter Helene Cooper on December 12, 2017. I was not named in the subsequent two articles (Cooper et al. 2017a; 2017b) except that one included my input under an introductory statement about UFO sightings. It read: "Experts caution that earthly explanations often exist for such incidents, and that not knowing the explanation does not mean that the event has interstellar origins" (Cooper et al. 2017b).

The DIA had not acknowledged the program's existence until it was revealed by Cooper and two coauthors, reporter Ralph Blumenthal and a credulous flying-saucer promoter and writer, Leslie Kean (see, e.g., Kean 2010). Had I known the latter was involved, I would have warned the *New York Times* to tread carefully.

Indeed, the respected newspaper did come in for some deserved criticism, including from *New York* magazine for "implying that extraterrestrials are real." The magazine added, "For ufologists who had dreamed of being taken seriously by the mainstream media, the story was a dream come true" (Wise 2017). Most problematic was the second of the articles, despite its disclaimer.

Strange Incident

That article told of a 2004 incident that occurred when two Navy F-18 fighter planes were sent to investigate a mysterious object and it suddenly accelerated—like nothing the airmen had ever seen before. Intrigued, I contacted Major James McGaha, with whom I have often worked, especially on UFO cases. A former U.S. Air Force special operations pilot, he is also an astronomer and so has a unique knowledge of the sky. We set to work on the case.

Something is wrong in the information here: How could someone see what a forty-foot object was doing from forty miles away?

According to the *New York Times* article, navy airmen—Commander David Fravor and Lt. Commander Jim Slaight—had been with a squadron on a training mission over the Pacific some 100 miles from San Diego. The date was November 14, 2004. The incident began when Fravor was radioed by a radar operator on a Navy cruiser, the USS Princeton, asking them to investigate some unknown objects at a particular vector. He was accompanied by another F-18.

When the two planes arrived at what is termed "merge point"—that is, so close that the Princeton's radar could not distinguish them from the unknown object—the pilots saw nothing. But when Fravor looked down he saw the sea churning. Was this from a

crashed aircraft as Fravor first thought or from, he would later suggest, possibly a submarine (as from the *Nimitz*'s own carrier strike group)?

Unfortunately, there are different versions of Fravor's subsequent experience. First the *New York Times*, mentioning the churning water, states that "some kind" of white, oval aircraft about thirty to forty feet long was "hovering 50 feet above the churn." But as Fravor descended, the object ascended toward him. He said, "We were at least 40 miles away, and in less than a minute this thing was already at our cap point" (Cooper 2017b).

Yet something is wrong in the information here: How could someone see what a forty-foot object was doing from forty miles away?

Cmdr. David Fravor and Lt. Cmdr. Jim Slaight.

Another version of Fravor's experience is provided in a "truly curious document that tells Fravor's story in the form of a military-style briefing" with portions blacked out to give a pseudo top-secret appearance (Wise 2017). It is in fact a third-person account of an interview with Fravor, produced by a fringe-ideas group called To the Stars Academy of Arts and Science. That group includes Luis Elizondo, *who had previously headed the Pentagon UFO study* (actually named Advanced Aviation Threat Identification Program), mentioned earlier. The group's founders include former pop singer Tom DeLonge and former Scientologist and parapsychologist Harold E. Puthoff (Austin 2017).

In this second, earlier report ("Pilot report" 2017), which calls Fravor "Source," the unidentified object above the churning water "traveled from left to right over the disturbed water at an altitude of approximately 1000 to 3000 feet"—not fifty feet above, as the other version had reported. (Investigators can scarcely be expected to explain some occurrence when what is alleged is presented with such contradictions and seriously incomplete and disjointed reporting.) Fravor went on to say that as the second plane aggressively dropped and maneuvered, to catch up with the object, it behaved "as if it knew or somehow anticipated what they were going to do and even pointed toward them!" To us, it sounds almost as if the airmen were deliberately being buzzed by a reconnaissance drone! Were they being tested as part of their training?

Investigators can scarcely be expected to explain some occurrence when what is alleged is presented with such contradictions and seriously incomplete and disjointed reporting.

Whatever actually happened, the UFO then disappeared, Fravor said, having "accelerated like nothing I've ever seen" (Cooper et al. 2017b). When the two jets returned to their aircraft carrier, the USS *Nimitz*, something interesting occurred: "… everyone on the ship had learned of Commander Fravor's encounter and was making fun of him" (Cooper et al. 2017b). They were playing alien movies such as *Men in Black* and *The X-Files* on the ship's onboard closed-circuit TV ("Pilot report" 2017). Given that "everyone" made fun of Fravor, one must wonder why: Did he have a reputation as a UFO believer, or did they know something he didn't?

The Video

Fravor says another group of F-18s "also encountered the same object later the same day." Viewing a video from that flight, "Source [Fravor] identified the object affirmatively as the one they saw earlier" ("Pilot Report" 2017). Apparently this video—not one from Fravor's plane—was the one released by the To the Stars group.

It seems possible that Fravor's sighting has become merged with the separate incident shown by the video. Both involve an object described as looking like a "tic-tac" candy mint—without apparent wings, rotors, windows, or other features—and completely white. This is indicative of an object seen on an infrared video (like the video in question). Thus, there may well be confusion as to what was supposedly seen by Fravor and what had been related to him. Such confusion could easily have occurred over the intervening thirteen years.

Either the first or second object in question, if seen only on a video screen, might well have been a drone or distant airplane. Even if it were too far away to be visible, its heat signature could have been viewed by infrared. Another possibility was given by Fravor himself. Interestingly, before the planes were sent to the site, the controller had made sure they were not weaponized. After the encounter, Fravor had "initially thought that perhaps this was an unannounced, classified missile test by a U.S. Navy submarine," but he now concludes, "There is no way any aircraft or missile that I know of could conduct maneuvers like what we saw that day" ("Pilot report" 2017). Nevertheless, there is confusion over just what occurred. Fravor insists, "I know what I saw" (quoted in Finucane 2018), while just as surely admitting, "I have no idea what I saw" (quoted in Cooper et al. 2017b). We have observed this many times: A person has mistaken perceptions, or he experiences something that seems unusual, and soon is insisting that he knows what he saw, ego becoming involved. In fact, he only knows what he thinks he saw, and that can change over time.

In any event, this brings us to the video in question, which shows an object's rapid acceleration to the left and

disappearance from the video screen. What we see on the video is probably a trick of optics, according to Major McGaha. He believes the sudden leftward-zooming of the object resulted from the camera having momentarily reached the limit of its panning ability, at which time the F-18 was banking. This created the onscreen illusion that the object suddenly shot away. As corroboration, McGaha notes that the angle of the object's moving off the screen is correlated to the bank angle of the F-18. What was no longer viewed was presumed to have disappeared at a tremendous speed.

As it happened, this was Fravor's "first military assignment as a pilot for the U.S. Navy's F-18 Super Hornet." It obviously rattled him. As he was stung by being made fun of on returning to the *Nimitz*, he "made detailed written notes of the incident" that he mailed to an aunt, noting, "Keep this because this is important stuff about some real X-Files shit" ("Pilot report" 2017). No one was going to tell *him* he could have been mistaken about his experience—which, after all, appears to have been a series of misunderstandings and misperceptions.

Conclusions

New York magazine summed up the retired Fravor's current celebrity status:

> It seems that To the Stars is trying to shroud Fravor's account in a spooky fog of *faux* top secrecy. This is a dicey strategy given Fravor's prominence in online UFO circles, and gives the impression that Elizondo's company is repackaging timeworn tales from the internet as freshly revealed government X-files. And, by extension, [it] calls into question the *Times*' wisdom in taking his claims about extraterrestrial encounters at face value. (Wise 2017)

To recap, we suggest that several things were going on during what was, after all, a training mission of the USS *Nimitz* carrier strike group. We believe the churning water Fravor first saw was caused by a submerging sub; that the sightings of a UFO above the water (variously reported)—which hovered, then came toward one pilot—could have been those of a reconnaissance drone; that there may have been confusion (then and later) over the object or objects caused by the admixture of visual sightings with infrared video viewing; and, finally, that one video image showing an object suddenly zooming off screen was likely caused by the plane's banking while the camera was stopped at the end of its sweep.

If UFO proponents claim inconsistencies in our scenario, we shall point out confusion and incompleteness in the reports. Apparently not only had the incident not been considered serious enough to have warranted a debriefing of Fravor—let alone of the several other pilots and radar operator—but most of the carrier group's personnel at the time regarded Fravor's response as laughable. Major McGaha and I regard the entire incident not as evidence of an extraterrestrial encounter but as a comedy of errors involving the pilots.

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Skeptical Inquirer

Here's just a sample of what you'll find online at csicop.org:

A Look at Changelings

In his special article "The Enduring Legend of the Changeling," psychologist Stuart Vyse examines belief in changelings, a version of fairy folklore common in the British Isles (and Ireland in particular) in which parents come to believe that their baby has been secretly swapped for an identical fairy child called a changeling. As Vyse notes, "The prescribed test for a suspected changeling was to heat the blade of a shovel until it was red hot and have the child sit on it. If a fairy child had been substituted for the true child, it would fly away." This, predictably, led to the horrific abuse and deaths of many children over the years.

Crisis Actors, Inc.

Bob Blaskiewicz, also known as "The Conspiracy Guy," looks at the rise in recent years of conspiracies about so-called "crisis actors," as promoted by Alex Jones and others. The idea that mass shootings are staged or faked is implausible on its face, but "conspiracy theorists think that if they—or think they—recognize the same person at two events or if they can catch supposed victims 'out of character,' they have shown that the event is a hoax, or at least not what it appears to be."

[NOTES ON A STRANGE WORLD MASSIMO POLIDORO

Massimo Polidoro is an investigator of the paranormal, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His website is at www.massimopolidoro.com.

Does the Vatican Hold a Painting of a UFO?

Did Raphael—"The Divine One," as this great painter was often described—document a UFO crash during the Renaissance?

It's a story that resurfaces from time to time on some UFO websites. It all starts with a beautiful painting, *The Madonna of Foligno*, created in 1511 by Raphael on a commission from Sigismondo de' Conti, chamberlain to Pope Julius II and prefect of Saint Peters' Factory.

It was originally placed on the high altar of the church of Santa Maria in Aracoeli in Rome, where Sigismondo was buried, but today it can be seen in the special room devoted to Raphael at the Pinacoteca Vaticana of the Vatican Museums in Vatican City—a room universally considered by visitors to be the summit of the whole Pinacoteca.

There are three main masterpieces on exhibit there: the *Transfiguration*, the *Oddi Altarpiece* and *The Madonna of Foligno*. The subject of the latter is a "holy conversation" in which some sacred figures appear to be in conversation between themselves and seem to also address the audience. We can see at the center the Virgin Mary sitting on a cloud, holding baby Jesus. On the right we have Sigismondo himself, kneeling on the ground and wearing a red cape, along with Saint Jerome standing behind him. On the left, mirroring them, is St. Francis of Assisi kneeling and St. John the Baptist standing.

In the middle of the ground is a mysterious angel holding a plaque that has no inscriptions on it. Is he trying to tell us something?

But the real mystery is behind this little crowd. Near the head of the angel, it is possible to see the house of Sigismondo Conti and, above it, a mysterious

reddish object falling from the sky. Is this proof of a UFO contact or, as some say, of an unprecedented flying saucer crash?

Nothing of the sort.

In the past, various paintings from Medieval and Renaissance masters have been the subject of similar questions. The *Madonna with Child and San Giovannino* by Sebastiano Mainardi at Palazzo Vecchio in Florence, for example, shows a strange oval figure suspended in the sky: Is it a UFO? The *Annunciation* by Carlo Crivelli at the National Gallery in London has an object suspended in the sky that seems to direct a strange "ray of light" to the Madonna: The chronicle of an alien abduction?

Of course not, but to explain these and other apparent mysteries it is necessary to remember that ancient painters were asked to draw their inspiration from very precise biblical references and were expected to insert symbolic meanings that were anything but random.

The object in Mainardi's painting, for example, is a "luminous cloud," an element described in the apocryphal Gospels that is present in many "adorations" of the period. Looking closely at Crivelli's painting, on the other hand, we can see that the object in the sky is a vortex of angels in the clouds, another frequent representation of God in Medieval and Renaissance sacred works of art.

As for the *Madonna of Foligno*, the painting was commissioned by Sigismondo to Rapahel as an *ex-voto* to the Virgin, a thank you present, for having saved his house in Foligno from burning when it was hit by lightning. This is the meaning of the orange "object" flying toward the house. Sure, it could have been a fireball, consumed before touching the ground, or maybe even a meteorite, although no chronicles exist of this latter event. But certainly, it was no UFO crash, of which there are no traces.

And why does the angel carry a sign with nothing written on it? The reason is simple: Sigismondo died before seeing the painting and did not have the time to dictate to Raphael the text, the explanatory "thank you note" to the Madonna.

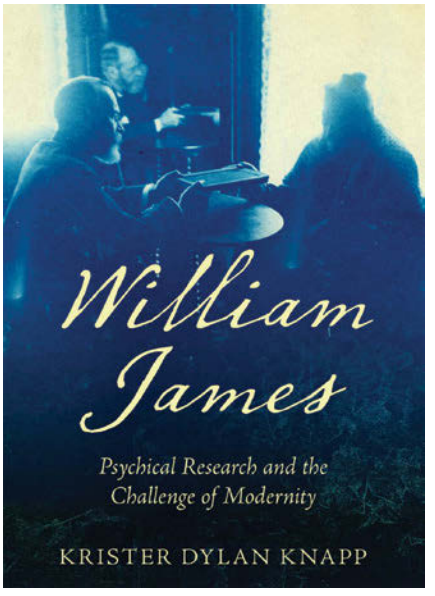
The usual error of so-called "ancient astronauts" theories is that of reinterpreting with the eyes of twenty-first–century Europeans the product of other cultures. Furthermore, as this case proves, the fact of having no knowledge whatsoever of the history of art appears to be a mandatory requirement for mystery mongers everywhere.

Stuart Vyse is a psychologist and author of *Believing in Magic: The Psychology of Superstition*, which won the William James Book Award of the American Psychological Association. He is a fellow of the Committee for Skeptical Inquiry.

William James and the Psychics

Why did one of the great figures in the history of psychological science, a Harvard University professor who supervised the earliest U.S. doctoral degrees in psychology, spend many years attending séances and ultimately come to support the honesty and integrity of a famous Boston medium? Even in those early days of psychology, most of William James's colleagues derided mediumship and felt psychics were not worthy of serious study, yet James did extensive research on psychics throughout his career in the hope of finding evidence of an afterlife. A number of biographers have suggested the explanation was personal: James and his wife, Alice, were drawn to psychics in 1885 following the death of their young son, Herman (Blum 2007; Simon 1999). A new book on James's psychical research suggests that whatever effect Herman's death might have had, it was far less important than James's longstanding interest in the possibility of the soul's immortality. The seeds of James's fascination were planted in his boyhood and nurtured by many cultural and philosophical forces throughout his life.

Philosopher and psychologist William James (1842–1910), who taught at Harvard in the late nineteenth and early twentieth centuries, was one of the most important early figures in the history of psychological science. Official credit for the founding of psychology goes to Wilhelm Wundt, who opened the first psychological laboratory at the University of Liebzig in 1879. The first American laboratory was founded at Johns Hopkins University by G. Stanley Hall, who had briefly worked in Wundt's laboratory. Hall also earned the first American PhD in psychology—studying under James at Harvard. He also started the *American Journal of Psychology* and became the first president of the American Psychological Association (Parry 2006).



James understood the importance of laboratory work, but because he was not personally drawn to it, he hired Hugo Münsterburg, a student of Wundt's, to run the psychology laboratory at Harvard (Benjamin 2009). Nonetheless, James wrote an important early textbook, *Principles of Psychology* (James [1890] 1981), that drew many students to the field, and he helped educate several of the early leaders of psychological science, including Hall and Mary Whiton Calkins, who would go on to build a laboratory at Wellesley College and become the first woman president of the American Psychological Association.

Historian Krister Dylan Knapp's 2017 book *William James: Psychical Research and the Challenge of Modernity* provides a very detailed account of how William James became involved in psychical research. Among other things, Knapp demonstrates that James's work in this area was far from a sidelight or a passing fancy. For obvious reasons, most historians of psychology make at most passing reference to James's involvement with spiritualists and mediums, but Knapp's thorough research reveals the many influences that led to a lifelong preoccupation.

James's Boyhood

James grew up in a privileged and stimulating environment. His father, Henry James Sr., was independently wealthy and had the freedom to satisfy his intellectual curiosities. He was particularly drawn to the "non-normal" and tended to drift from one cause or idea to another. At various points Henry Sr. was occupied with Swedenborgianism,[1] abolitionism, women's suffrage, free love, and, of course, spiritualism. The family home on West Fourteenth Street between 5th and 6th Avenues in New York City was frequently filled with local intellectuals and literary figures. Rather than being sent away, the children were required to participate in adult conversations. As a result, James, his younger brother, Henry Jr. (who would become the famous novelist), and the other children were exposed to a diverse set of ideas. Spiritualism was

very popular in the mid-nineteenth century, and Knapp suggests that James would have had at least indirect exposure to the Fox sisters.

The Fox sisters of Hydesville, New York, were mediums who became quite famous in the mid-nineteenth century. Margaret (Maggie) and Kate purported to communicate with a "Mr. Splitfoot," who made rapping sounds in response to yes/no questions. Their older sister Leah acted as manager for the other two, and the trio traveled widely and became a major force in the growing popularity of mediumship and spiritualism. The success of spiritualism was also bolstered by its close association with the social reform movements of the nineteenth century. Harriet Beecher Stowe, Sojourner Truth, and Mary Todd Lincoln (who held séances in the White House) were all spiritualists, and perhaps because many of the mediums of that period were women, spiritualism was particularly linked to the movement for women's rights.

New York Tribune Editor Horace Greeley was a member of Henry James Sr.'s circle, and in 1850, Greeley and several other members of their group decided to investigate the Fox sister phenomenon. They arranged a séance with the Fox sisters in New York City, following which the group came away with a split decision. Some observers were convinced of the sisters' powers, and others were skeptical. Greeley went on to have a series of additional readings with the Fox sisters and eventually fell somewhere between these poles of belief, perhaps leaning toward belief. At one point he wrote that through the Fox sisters he had a conversation with a man who reported on the whereabouts of Edgar Allan Poe in the afterlife.

Knapp suggests that the young William James—who would have been eight years old at the time of these séances—would probably have participated in discussions of the Fox sisters. Furthermore, Knapp points out that the Fox sisters were enormously popular in the summer of 1850, when they spent two months in the financial district of New York. William and Henry Jr. were very familiar with street life in the city and all the popular entertainments of the time. As a result, Knapp suggests it was quite possible the boys came into direct contact with the Fox sisters as well.

James's Early Academic Career

In the years just before he began teaching at Harvard, James published a review of a book on spiritualism and attended a séance. In this case, he quickly discovered the medium was a fraud—obvious fraud was common—moving a piano not by psychic power but with the aid of what he described as a "wonderfully strong and skillful knee" (Knapp 2017, 58). James's writings about spiritualism at that time reflected a degree of skepticism, but he maintained the view that spiritualism was worthy of serious investigation.

In 1874 when James began to teach at Harvard, Boston was a hotbed of spiritualism. A weekly spiritualist newspaper, *The Banner of Light*, advertised the services of various mediums and published articles on spiritualist topics. Séances were a popular form of evening entertainment. James was committed to conducting psychical research, but in the early years of his tenure at Harvard, he was busy building a family. However, in 1882 while visiting his brother Henry Jr. in England, James was introduced to a group of people who were interested in psychical research. In the same year, the group founded the Society for Psychical Research (SPR), which survives to this day. In 1884, James both joined the SPR and helped start the United States branch, the American Society for Psychical Research (ASPR). Also in 1884, the SPR launched the *Journal of the Society for Psychical Research*, which is still in publication today. All of this happened before the death of James's son, Herman.

The Fox sisters.

In those early days of psychology, most of William James's colleagues derided mediumship and felt psychics were not worthy of serious study, yet James did extensive research on psychics throughout his career.

The Case of Leonora Piper

In James's time, SPR and the ASPR included members who varied in their degree of skepticism and belief. Both societies published articles that exposed fraudulent mediums, but many members clearly believed that some kind of afterlife existed and that communication with the souls therein was possible. James found little value in his investigations of physical mediums—people who, like the Fox sisters, purported to communicate with the dead through rapping sounds, table tipping, or

The Tender-Minded	The Tough-Minded
Rationalistic (going by "principles")	Empiricist (going by "facts")
Intellectualistic	Sensationalistic
Idealistic	Materialistic
Optimistic	Pessimistic
Religious	Irreligious
Free-willist	Fatalistic
Monistic	Pluralistic
Dogmatical	Skeptical

Table 1. James identified two distinct temperaments in the philosophers of the day: the tender-minded and the tough-minded.

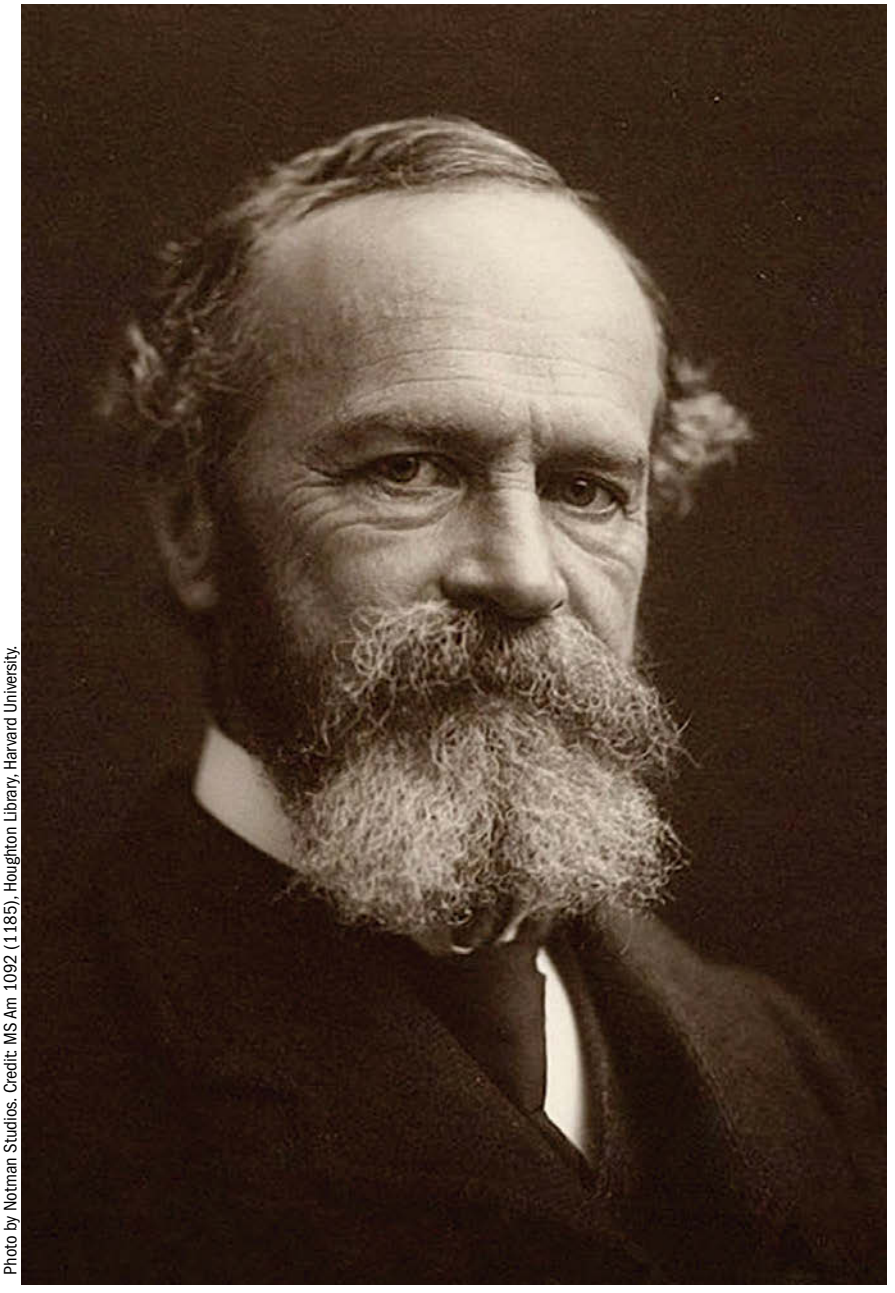


Photo by Notman Studios. Credit: MS Am 1092 (1185), Houghton Library, Harvard University.

William James in 1903.

the movement of objects through the air. Most seemed to be engaged in deliberate trickery. But James was more hopeful about trance mediums who appeared to go into a different state of consciousness and communicate by voice—sometimes in foreign languages—or automatic writing.

The most famous and convincing of these psychics was Leonora Piper, whom William and Alice James visited shortly after the death of their son. Piper was a trance medium who reported the messages of a "Dr. Phinuit," although she would later develop other characters as "controls," including James's psychical research colleague and friend Richard Hodgson after his death. James would go on to attend séances with Piper for thirteen years and conclude that she offered the "dramatic possibility" that her mediumship was real.

As with many of the cases he examined, James's evaluation of Piper seemed to rest on his assessment of her personality. She was a quiet housewife who did not advertise her mediumship services in the *Banner of Light* and did not seek fame, but she was willing to be investigated and to receive payments for her sittings. Trance mediumship allowed for stenographers to record what the medium said during the séance, making it possible to study the content of the séance after the event, but James's approach to psychical research was not particularly scientific by today's standards. For example, the Jameses attended so many sittings with Piper that she essentially became a friend of the family, and in the fall of 1889, the family hosted Piper for a week at their summer home in New Hampshire. This

kind of loss of objectivity was not uncommon. Years earlier, Horace Greeley, before coming to his credulous assessment of the Fox sisters, had invited them to stay at his home for a week while conducting séances, and Kate Fox accepted the invitation. James attempted to maintain an objective assessment of Piper, but in the end seemed to become a believer, as suggested by the following passage:

> My own conviction is not evidence, but it seems fitting to record it. I am persuaded of the medium's honesty, and of the genuineness of her trance; and although at first disposed to think that the "hits" she made were either lucky coincidences, or the result of knowledge on her part of who the sitter was and of his or her family affairs, I now believe her to be in possession of a power as yet unexplained. (Quoted in Knapp 2017, 189)

James's Third Way

William James was a modern man influenced by the rise of Darwinism, the greater use of statistics and quantification, and recent advances of empirical methods. His goal was not to support or defend any particular religion, but he held on to the possibility that there was a God and that there was some kind of afterlife of the soul. With respect to his psychical research, Knapp suggests he was neither a believer nor a skeptic/debunker. Instead, James supported a *tertium quid*—third way—approach that was somewhere between the two poles. In his famous essay "Pragmatism" (James [1907] 1995), James identified two distinct temperaments in the philosophers of the day: the tender-minded and the tough-minded. He used the adjectives in Table 1 to describe each.

In James's world, the spiritualist believers were tender-minded and the skeptical nonbelievers were tough-minded. The tough-minded temperament was also common among many of his psychological contemporaries, including G. Stanley Hall, James McKeen Cattell, and Hugo Münsterburg, all of whom thought psychical research was a waste of time.

James hoped to reconcile these two competing attitudes with his third way. He was an empiricist who valued facts when facts could be found, but in those cases that were "yet unexplained," he supported a kind of agnosticism, maintaining the possibility of belief. This view is also seen in his famous essay "The Will to Believe" (James 1897).

"The Will to Believe" was written in response to another famous essay, "The Ethics of Belief," by British mathematician and philosopher William Kingdon Clifford (1886). Clifford was an extremely tough-minded skeptic who famously wrote: "It is wrong in all cases to believe on insufficient evidence." For reasons that by now should be obvious, James found this kind of stance overly restrictive and argued that it was justifiable to hold certain beliefs based on insufficient evidence, particularly if they might have value to the believer. In "The Will to Believe," James supported a version of Pascal's Wager. French mathematician Blaise Pascal famously offered a cost-benefit analysis, suggesting it is best to live a Christian life despite very small odds that heaven is real because the inconvenience of Christian life is small in relation to the possible reward of a life in the hereafter. James argued that an idea that is still a "living hypothesis," one that has not been directly refuted by facts, can be maintained if believing has possible benefits. One such case would be when believing in God now is required to gain salvation later.

"The Will to Believe" is most often interpreted as a defense of religious belief, but Knapp's book shows that James was undoubtedly also thinking about his psychical research. "The Will to Believe" was first presented as a lecture in 1896. James would go on to be involved in and write about psychical research almost until his death in 1910.

James was perhaps the first eminent psychological scientist to be a supporter of psychical research, but he is far from the last. I have previously written in this column about Cornell University psychologist Daryl Bem, who has published a number of papers—now largely discredited—claiming to demonstrate psi phenomena (Vyse 2017). Perhaps even more interesting is the case of Gary Schwartz, who has carried on in James's tradition, attempting to prove valid communication with the dead. Schwartz codirected the Behavioral Medicine Clinic at Yale University before moving to the University of Arizona, where most of his mediumship research was conducted. (Schwartz's research has been critiqued a number of times in the pages of Skeptical Inquirer [e.g., Wiseman and O'Keeffe 2001; Hyman 2003; Hall 2008].)

In an interesting twist on the story of William James and the psychics, Schwartz (2010) published an article reporting two "proof of concept" experiments supporting the idea that William James may be continuing his psychical research—"from the other side." I will leave it to interested readers to decide how likely they find that hypothesis to be.

Note

1. Based on the ideas of Emanuel Swedenborg (1688–1772), a Swedish scientist, philosopher, and mystic. He had a very well-developed theory of the afterlife that appealed to many nineteenth-century spiritualists.

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[SKEPTICAL INQUIREE BENJAMIN RADFORD

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The Case of the Curious Christmas Light

Q: A few years ago I took an otherwise normal photo of a Christmas tree hunt near my hometown. The photo is of my daughter carrying our Christmas tree with her dad. You can clearly see a strange orange orb that seems to have a distinct center—inside the tree! I am one to look for logical explanations before jumping to paranormal conclusions, but this one has me stumped. Can you offer an explanation?
—Tammy S.

A: Tammy sent me the photograph (Figure 1), and I then replied asking her to provide more details about the circumstances of the image. She soon followed up:

> I have researched fake orbs trying to find a logical explanation for my photo. It was a sunny day, and I suspected there might be some type of reflection or refraction from my camera, but the orb appears in an area where there doesn't appear to be anything for it to reflect off of, and my camera was not pointed directly into the sunlight. I did take a series of photos immediately before and after (the series is: one cutting the tree, the one with the orb, and then one carrying the tree farther away). Those all appear completely normal.

There wasn't much more information, though we were able to determine when the photo was taken (Saturday, November 29 at 11:22:58 AM) by examining the photo properties of the jpeg file—assuming of course that the time was set up correctly when the camera was initialized.

Figure 1.

I examined the photo and first tried to determine whether the object was emitting or reflecting light. Given the proximity of her daughter's right hand (carrying the tree trunk) to the orange glow, at first glance it looked like it could have been a reflection, for example from a piece of amber jewelry. However, the shape of the anomaly made me suspect it was lens flare. To be sure, I spent a few minutes measuring the shadows to get an idea of where (outside the frame) the sun would be and marked them using photo editing tools in a copy of the photograph (Figure 2).

I replied to Tammy and sent her the photo:

> You are right that there's nothing in the outline of the tree to reflect off of; the reflection is not outside the camera but inside it. I have attached the photo showing the location of the sun given the angle of the shadows and the time stamp on the file; the mystery glowing spot is directly beneath the sun. Lens flare occurs when a point of light source (often—and in this case—the sun) is much brighter than the rest of the scene, and it either happens to be in the image (within lens angle of view), or simply hits the front element of a lens without being present in the image. It can take a wide variety of appearances, ranging from haze to round orbs and polygons. Often they are white or transparent white, but sometimes

Figure 2.

they are orange (as in your photo), yellow, red, or other colors. If you're interested, you could probably get the same effect with some trial and error! Don't feel bad about not recognizing it, though—it does look weird.

I was pretty sure of my explanation but also sent it to Kenny Biddle of the *Geeks and Ghosts* podcast. He agreed it was definitely lens flare; the telltale sign to him was the tiny cross in the center. Even a smart, skeptical person can be fooled by something strange in a photograph; though lens flare often occurs when the sun (or another bright light) is within the frame, it can also occur outside it. Another mystery solved.

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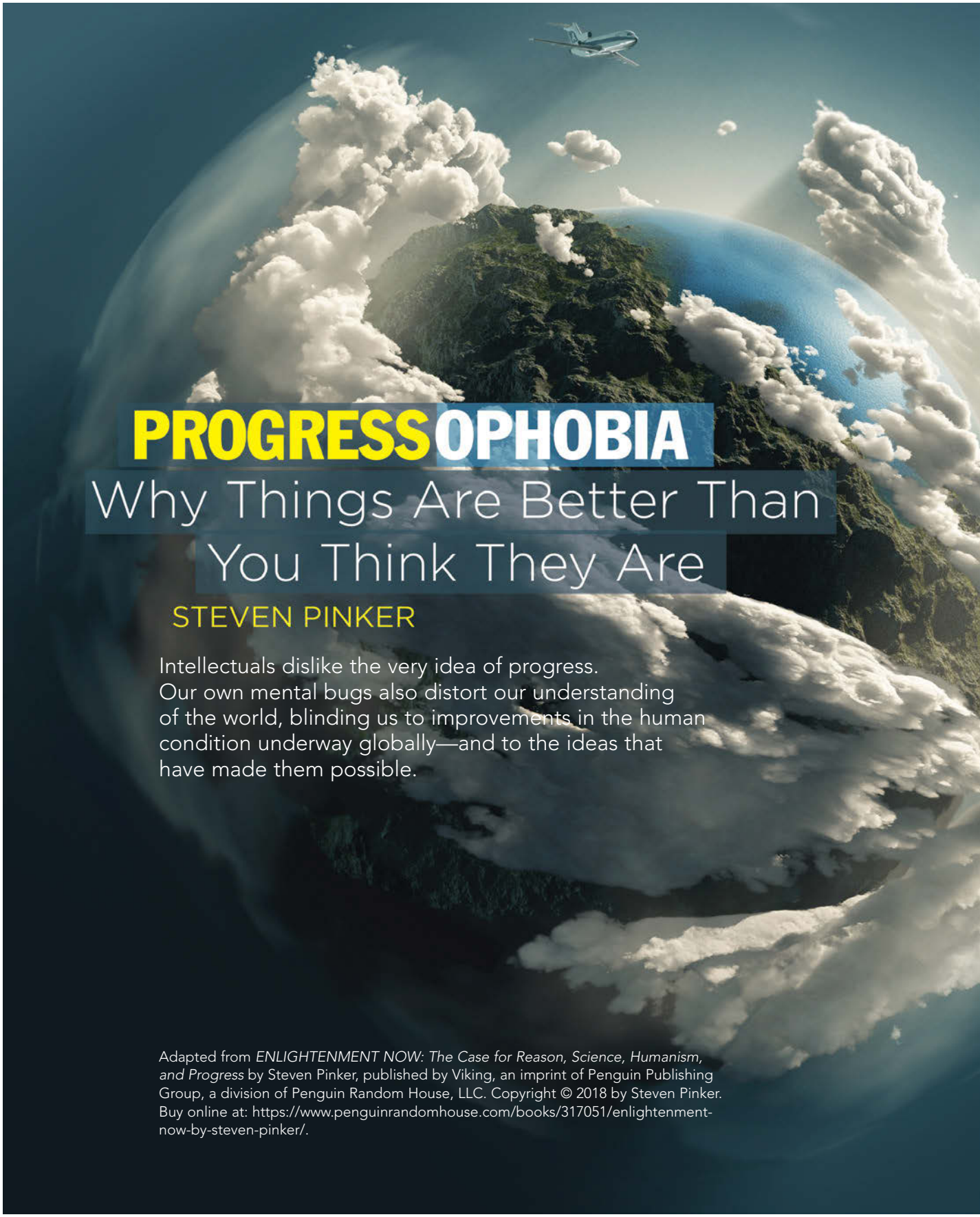


PROGRESSOPHOBIA

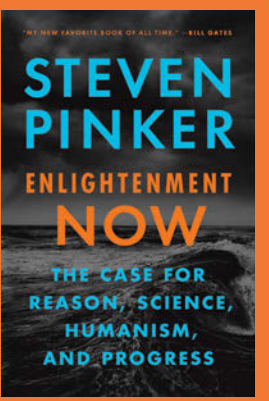
Why Things Are Better Than You Think They Are

STEVEN PINKER

Intellectuals dislike the very idea of progress. Our own mental bugs also distort our understanding of the world, blinding us to improvements in the human condition underway globally—and to the ideas that have made them possible.

Adapted from *ENLIGHTENMENT NOW: The Case for Reason, Science, Humanism, and Progress* by Steven Pinker, published by Viking, an imprint of Penguin Publishing Group, a division of Penguin Random House, LLC. Copyright © 2018 by Steven Pinker. Buy online at: https://www.penguinrandomhouse.com/books/317051/enlightenment-now-by-steven-pinker/.

The Underappreciated Enlightenment



The Enlightenment principle that we can apply reason and sympathy to enhance human flourishing may seem obvious, trite, old-fashioned. I wrote *Enlightenment Now* because I have come to realize that it is not. More than ever, the ideals of reason, science, humanism, and progress need a wholehearted defense. We take its gifts for granted: newborns who will live more than eight decades, markets overflowing with food, clean water that appears with a flick of a finger and waste that disappears with another, pills that erase a painful infection, sons who are not sent to war, daughters who can walk the streets in safety, critics of the powerful who are not jailed or shot, the world's knowledge and culture available in a shirt pocket. But these are human accomplishments, not cosmic birthrights. In the memories of many readers—and in the experience of those in less fortunate parts of the world—war, scarcity, disease, ignorance, and lethal menace are a natural part of existence. We know that countries can slide back into these primitive conditions, and so we ignore the achievements of the Enlightenment at our peril.

—Steven Pinker

Intellectuals hate progress. Intellectuals who call themselves "progressive" *really* hate progress. It's not that they hate the *fruits* of progress, mind you: most pundits, critics, and their *bien-pensant* readers use computers rather than quills and inkwells, and they prefer to have their surgery with anesthesia rather than without it. It's the *idea* of progress that rankles the chattering class—the Enlightenment belief that by understanding the world we can improve the human condition.

An entire lexicon of abuse has grown up to express their scorn. If you think knowledge can help solve problems, then you have a "blind faith" and a "quasi-religious belief" in the "outmoded superstition" and "false promise" of the "myth" of the "onward march" of "inevitable progress." You are a "cheerleader" for "vulgar American candoism" with the "rahrah" spirit of "boardroom ideology," "Silicon Valley," and the "Chamber of Commerce." You are a practitioner of "Whig history," a "naïve optimist," a "Pollyanna," and of course a "Pangloss," a modern-day version of the philosopher in Voltaire's *Candide* who asserts that "all is for the best in the best of all possible worlds."

Professor Pangloss, as it happens, is what we would now call a pessimist. A modern optimist believes that the world can be *much, much* better than it is today. Voltaire was satirizing not the Enlightenment hope for progress but its opposite, the religious rationalization for suffering called theodicy, according to which God had no choice but to allow epidemics and massacres because a world without them is metaphysically impossible.

Epithets aside, the idea that the world is better than it was and can get better still fell out of fashion among the clerisy long ago. In *The Idea*

of Decline in Western History, Arthur Herman shows that prophets of doom are the all-stars of the liberal arts curriculum, including Nietzsche, Arthur Schopenhauer, Martin Heidegger, Theodor Adorno, Walter Benjamin, Herbert Marcuse, Jean-Paul Sartre, Frantz Fanon, Michel Foucault, Edward Said, Cornel West, and a chorus of eco-pessimists.[1] Surveying the intellectual landscape at the end of the 20th century, Herman lamented a "grand recessional" of "the luminous exponents" of Enlightenment humanism, the ones who believed that "since people generate conflicts and problems in society, they can also resolve them." In *History of the Idea of Progress*, the sociologist Robert Nisbet agreed: "The skepticism regarding Western progress that was once confined to a very small number of intellectuals in the nineteenth century has grown and spread to not merely the large majority of intellectuals in this final quarter of the century, but to many millions of other people in the West."[2]

Yes, it's not just those who intellectualize for a living who think the world is going to hell in a handcart. It's ordinary people when they switch into intellectualizing mode. Psychologists have long known that people tend to see their own lives through rose-colored glasses: they think they're less likely than the average person to become the victim of a divorce, layoff, accident, illness, or crime. But change the question from the people's *lives* to their *society,* and they transform from Pollyanna to Eeyore.

Psychologists have long known that people tend to see their own lives through rose-colored glasses: they think they're less likely than the average person to become the victim of a divorce, layoff, accident, illness, or crime.

Public opinion researchers call it the Optimism Gap.[3] For more than two decades, through good times and bad, when Europeans were asked by pollsters whether their *own* economic situation would get better or worse in the coming year, more of them said it would get better, but when they were asked about their *country's* economic situation, more of them said it would get worse.[4] A large majority of Britons think that immigration, teen pregnancy, litter, unemployment, crime, vandalism, and drugs are a problem in the United Kingdom as a whole, while few think they are problems in their area.[5] Environmental quality, too, is judged in most nations to be worse in the nation than in the community, and worse in the world than in the nation.[6] In almost every year from 1992 through 2015, an era in which the rate of violent crime plummeted, a majority of Americans told pollsters that crime was rising.[7] In late 2015, large majorities in eleven developed countries said that "the world is getting worse," and in most of the last forty years a solid majority of Americans have said that the country is "heading in the wrong direction."[8]

Are they right? Is pessimism correct? Could the state of the world, like the stripes on a barbershop pole, keep sinking lower and lower? It's easy to see why people feel that way: every day the news is filled with stories about war, terrorism, crime, pollution, inequality, drug abuse, and oppression. And it's not just the headlines we're talking about; it's the op-eds and long-form stories as well. Magazine covers warn us of coming anarchies, plagues, epidemics, collapses, and so many "crises" (farm, health, retirement, welfare, energy, deficit) that copywriters have had to escalate to the redundant "serious crisis."

Whether or not the world really is getting worse, the nature of news will interact with the nature of cognition to make us think that it is. News is about things that happen, not things that don't happen. We never see a journalist saying to the camera, "I'm reporting live from a country where a war has not broken out"—or a city that has not been bombed, or a school that has not been shot up. As long as bad things have not vanished from the face of the earth, there will always be enough incidents to fill the news, especially when billions of smartphones turn most of the world's population into crime reporters and war correspondents.

And among the things that do happen, the positive and negative ones unfold on different time lines. The news, far from being a "first draft of history," is closer to play-by-play sports commentary. It focuses on discrete events, generally those that took place since the last edition (in earlier times, the day before; now, seconds before).[9] Bad things can happen quickly, but good things aren't built in a day, and as they unfold, they will be out of sync with the news cycle. The peace researcher John Galtung pointed out that if a newspaper came out once every fifty years, it would not report half a century of celebrity gossip and political scandals. It would report momentous global changes such as the increase in life expectancy.[10]

The nature of news is likely to distort people's view of the world because of a mental bug that the psychologists Amos Tversky and Daniel Kahneman called the Availability heuristic: people estimate the probability of an event or the frequency of a kind of thing by the ease with which instances come to mind.[11] In many walks of

life this is a serviceable rule of thumb. Frequent events leave stronger memory traces, so stronger memories generally indicate more-frequent events: you really are on solid ground in guessing that pigeons are more common in cities than orioles, even though you're drawing on your memory of encountering them rather than on a bird census. But whenever a memory turns up high in the result list of the mind's search engine for reasons other than frequency—because it is recent, vivid, gory, distinctive, or upsetting—people will overestimate how likely it is in the world. Which are more numerous in the English language, words that begin with *k* or words with *k* in the third position? Most people say the former. In fact, there are three times as many words with *k* in the third position (*ankle, ask, awkward, bake, cake, make, take* . . .), but we retrieve words by their initial sounds, so *keep, kind, kill, kid,* and *king* are likelier to pop into mind on demand.

Availability errors are a common source of folly in human reasoning. First-year medical students interpret every rash as a symptom of an exotic disease, and vacationers stay out of the water after they have read about a shark attack or if they have just seen *Jaws*.[12] Plane crashes always make the news, but car crashes, which kill far more people, almost never do. Not surprisingly, many people have a fear of flying, but almost no one has a fear of driving. People rank tornadoes (which kill about fifty Americans a year) as a more common cause of death than asthma (which kills more than four thousand Americans a year), presumably because tornadoes make for better television.

It's easy to see how the Availability heuristic, stoked by the news policy "If it bleeds, it leads," could induce a sense of gloom about the state of the world. Media scholars who tally news stories of different kinds, or present editors with a menu of possible stories and see which they pick and how they display them, have confirmed that the gatekeepers prefer negative to positive coverage, holding the events constant.[13] That in turn provides an easy formula for pessimists on the editorial page: make a list of all the worst things that are happening anywhere on the planet that week, and you have an impressive-sounding case that civilization has never faced greater peril.

The consequences of negative news are themselves negative. Far from being better informed, heavy newswatchers can become miscalibrated. They worry more about crime, even when rates are falling, and sometimes they part company with reality altogether: a 2016 poll found that a large majority of Americans follow news about ISIS closely, and 77 percent agreed that "Islamic militants operating in Syria and Iraq pose a serious threat to the existence or survival of the United States," a belief that is nothing short of delusional.[14] Consumers of negative news, not surprisingly, become glum: a recent literature review cited "misperception of risk, anxiety, lower mood levels, learned helplessness, contempt and hostility towards others, desensitization, and in some cases, …complete avoidance of the news."[15] And they become fatalistic, saying things like "Why should I vote? It's not gonna help," or "I could donate money, but there's just gonna be another kid who's starving next week."[16]

Seeing how journalistic habits and cognitive biases bring out the worst in each other, how can we soundly appraise the state of the world?

The answer is to *count*. How many people are victims of violence as a proportion of the number of people alive? How many are sick, how many starving, how many poor, how many oppressed, how many illiterate, how many unhappy? And are those numbers going up or down? A quantitative mindset, despite its nerdy aura, is in fact the morally enlightened one, because it treats every human life as having equal value rather than privileging the people who are closest to us or most photogenic. And it holds out the hope that we might identify the causes of suffering and thereby know which measures are most likely to reduce it.

That was the goal of my 2011 book *The Better Angels of Our Nature,* which presented a hundred graphs and maps showing how violence and the conditions that foster it have declined over the course of history. To emphasize that the declines took place at different times and had different causes, I gave them names. The Pacification Process was a fivefold reduction in the rate of death from tribal raiding and feuding, the consequence of effective states exerting control over a territory. The Civilizing Process was a fortyfold reduction in homicide and other violent crimes which followed upon the entrenchment of the rule of law and norms of self-control in early modern Europe. The Humanitarian Revolution is another name for the Enlightenment-era abolition of slavery, religious persecution, and cruel punishments. The Long Peace is the historians' term for the decline of great-power and interstate war after World War II. Following the end of the Cold War, the world has enjoyed a New Peace with fewer civil wars, genocides, and autocracies. And since the 1950s the world has been swept by a cascade of Rights Revolutions: civil rights, women's rights, gay rights, children's rights, and animal rights.

Few of these declines are contested among experts who are familiar with the numbers. Historical criminologists, for example, agree that homicide plummeted after the Middle Ages, and it's a commonplace among international-relations scholars that major wars tapered off after 1945. But they come as a surprise to most people in the wider world.[17]

I had thought that a parade of graphs with time on the horizontal axis, body counts or other measures of violence on the vertical, and a line that meandered from the top left to the bottom right would cure audiences of the Availability bias and persuade them that at least in this sphere of well-being the world has made progress. But I

learned from their questions and objections that resistance to the idea of progress runs deeper than statistical fallacies. Of course, any dataset is an imperfect reflection of reality, so it is legitimate to question how accurate and representative the numbers truly are. But the objections revealed not just a skepticism about the data but also an unpreparedness for the *possibility* that the human condition has improved. Many people lack the conceptual tools to ascertain whether progress has taken place or not; the very idea that things can get better just doesn't compute. Here are stylized versions of dialogues I have often had with questioners.

So violence has declined linearly since the beginning of history! Awesome!

No, not "linearly"—it would be astonishing if any measure of human behavior with all its vicissitudes ticked downward by a constant amount per unit of time, decade after decade and century after century. And not monotonically, either (which is probably what the questioners have in mind)—that would mean that it always decreased or stayed the same, never increased. Real historical curves have wiggles, upticks, spikes, and sometimes sickening lurches. Examples include the two world wars, a boom in crime in Western countries from the mid-1960s to the early 1990s, and a bulge of civil wars in the developing world following decolonization in the 1960s and 1970s. Progress consists of trends in violence on which these fluctuations are superimposed—a downward swoop or drift, a return from a temporary swelling to a low baseline. Progress cannot always be monotonic because solutions to problems create new problems.[18] But progress can resume when the new problems are solved in their turn.

Many people lack the conceptual tools to ascertain whether progress has taken place or not; the very idea that things can get better just doesn't compute.

By the way, the nonmonotonicity of social data provides an easy formula for news outlets to accentuate the negative. If you ignore all the years in which an indicator of some problem declines, and report every uptick (since, after all, it's "news"), readers will come away with the impression that life is getting worse and worse even as it gets better and better. In the first six months of 2016 the *New York Times* pulled this trick three times, with figures for suicide, longevity, and automobile fatalities.

Well, if levels of violence don't always go down, that means they're cyclical, so even if they're low right now it's only a matter of time before they go back up.

No, changes over time may be *statistical*, with unpredictable fluctuations, without being *cyclical*, namely oscillating like a pendulum between two extremes. That is, even if a reversal is possible at any time, that does not mean it becomes more likely as time passes. (Many investors have lost their shirts betting on a misnamed "business cycle" that in fact consists of unpredictable swings.) Progress can take place when the reversals in a positive trend become less frequent, become less severe, or, in some cases, cease altogether.

How can you say that violence has decreased? Didn't you read about the school shooting (or terrorist bombing, or artillery shelling, or soccer riot, or barroom stabbing) in the news this morning?

A decline is not the same thing as a disappearance. (The statement "$x > y$" is different from the statement "$y = 0$.") Something can decrease a lot without vanishing altogether. That means that the level of violence today is *completely irrelevant* to the question of whether violence has declined over the course of history. The only way to answer that question is to compare the level of violence now with the level of violence in the past. And whenever you look at the level of violence in the past, you find a lot of it, even if it isn't as fresh in memory as the morning's headlines.

All your fancy statistics about violence going down don't mean anything if you're one of the victims.

True, but they do mean that you're less likely to *be* a victim. For that reason they mean the world to the millions of people who are not victims but would have been if rates of violence had stayed the same.

So you're saying that we can all sit back and relax, that violence will just take care of itself.

Illogical, Captain. If you see that a pile of laundry has gone down, it does not mean the clothes washed themselves; it means someone washed the clothes. If a type of violence has gone down, then some change in the social, cultural, or material milieu has caused it to go down. If the conditions persist, violence could remain low or decline even further; if they don't, it won't. That makes it important to find out what the causes are, so we can try to intensify them and apply them more widely to ensure that the decline of violence continues.

To say that violence has gone down is to be naïve, sentimental, idealistic, romantic, starry-eyed, Whiggish, utopian, a Pollyanna, a Pangloss.

No, to look at data showing that violence has gone

down and say "Violence has gone down" is to describe a fact. To look at data showing that violence has gone down and say "Violence has gone up" is to be delusional. To ignore data on violence and say "Violence has gone up" is to be a know-nothing.

As for accusations of romanticism, I can reply with some confidence. I am also the author of the staunchly unromantic, anti-utopian *The Blank Slate: The Modern Denial of Human Nature,* in which I argued that human beings are fitted by evolution with a number of destructive motives such as greed, lust, dominance, vengeance, and self-deception. But I believe that people are also fitted with a sense of sympathy, an ability to reflect on their predicament, and faculties to think up and share new ideas—the better angels of our nature, in the words of Abraham Lincoln. Only by looking at the facts can we tell to what extent our better angels have prevailed over our inner demons at a given time and place.

How can you predict that violence will keep going down? Your theory could be refuted by a war breaking out tomorrow.

A statement that some measure of violence has gone down is not a "theory" but an observation of a fact. And yes, the fact that a measure has changed over time is not the same as a prediction that it will continue to change in that way at all times forever. As the investment ads are required to say, past performance is no guarantee of future results.

In that case, what good are all those graphs and analyses? Isn't a scientific theory supposed to make testable predictions?

A scientific theory makes predictions in *experiments* in which the causal influences are controlled. No theory can make a prediction about the world at large, with its seven billion people spreading viral ideas in global networks and interacting with chaotic cycles of weather and resources. To declare what the future holds in an uncontrollable world, and without an explanation of why events unfold as they do, is not prediction but *prophecy,* and as David Deutsch observes, "The most important of all limitations on knowledge-creation is that we cannot prophesy: we cannot predict the content of ideas yet to be created, or their effects. This limitation is not only consistent with the unlimited growth of knowledge, it is entailed by it."[19]

Our inability to prophesy is not, of course, a license to ignore the facts. An improvement in some measure of human well-being suggests that, overall, more things have pushed in the right direction than in the wrong direction. Whether we should expect progress to continue depends on whether we know what those forces are and how long they will remain in place. That will vary from trend to trend. Some may turn out to be like Moore's Law (the number of transistors per computer chip doubles every two years) and give grounds for confidence (though not certainty) that the fruits of human ingenuity will accumulate and progress will continue. Some may be like the stock market and foretell short-term fluctuations but long-term gains. Some of these may reel in a statistical distribution with a "thick tail," in which extreme events, even if less likely, cannot be ruled out.[20] Still others may be cyclical or chaotic. For now we should keep in mind that a positive trend suggests (but does not prove) that we have been doing something right, and that we should seek to identify what it is and do more of it.

When all these objections are exhausted, I often see people racking their brains to find *some* way in which the news cannot be as good as the data suggest. In desperation, they turn to semantics.

Isn't Internet trolling a form of violence? Isn't strip-mining a form of violence? Isn't inequality a form of violence? Isn't pollution a form of violence? Isn't poverty a form of violence? Isn't consumerism a form of violence? Isn't divorce a form of violence? Isn't advertising a form of violence? Isn't keeping statistics on violence a form of violence?

As wonderful as metaphor is as a rhetorical device, it is a poor way to assess the state of humanity. Moral reasoning requires proportionality. It may be upsetting when someone says mean things on Twitter, but it is not the same as the slave trade or the Holocaust. It also requires distinguishing rhetoric from reality. Marching into a rape crisis center and demanding to know what they have done about the rape of the environment does nothing for rape victims and nothing for the environment. Finally, improving the world requires an understanding of cause and effect. Though primitive moral intuitions tend to lump bad things together and find a villain to blame them on, there is no coherent phenomenon of "bad things" that we can seek to understand and eliminate. (Entropy and evolution will generate them in profusion.) War, crime, pollution, poverty, disease, and incivility are evils that may have little in common, and if we want to reduce them, we can't play word games that make it impossible even to discuss them individually.

•

I have run through these objections to prepare the way for my presentation of other measures of human progress. The incredulous reaction to *Better Angels* convinced me that it isn't just the Availability heuristic that makes people fatalistic about progress. Nor can the media's fondness for bad news be blamed entirely on a cynical chase for eyeballs and clicks. No, the psychological roots of progressophobia run deeper.

The deepest is a bias that has been summarized in the slogan "Bad is stronger than good."[21] The idea can be captured in a set of thought experiments suggested by Tversky.[22] How much better can you imagine yourself feeling than you are feeling right now? How much *worse* can you imagine yourself feeling? In answering the first hypothetical, most of us can imagine a bit more of a spring in our step or a twinkle in our eye, but the answer to the second one is: it's bottomless. This asymmetry in mood can be explained by an asymmetry in life (a corollary of

the Law of Entropy). How many things could happen to you today that would leave you much better off? How many things could happen that would leave you much *worse* off? Once again, to answer the first question, we can all come up with the odd windfall or stroke of good luck, but the answer to the second one is: it's endless. But we needn't rely on our imaginations. The psychological literature confirms that people dread losses more than they look forward to gains, that they dwell on setbacks more than they savor good fortune, and that they are more stung by criticism than they are heartened by praise. (As a psycholinguist I am compelled to add that the English language has far more words for negative emotions than for positive ones.)[23]

One exception to the Negativity bias is found in autobiographical memory. Though we tend to remember bad events as well as we remember good ones, the negative coloring of the misfortunes fades with time, particularly the ones that happened to us.[24] We are wired for nostalgia: in human memory, time heals most wounds. Two other illusions mislead us into thinking that things ain't what they used to be: we mistake the growing burdens of maturity and parenthood for a less innocent world, and we mistake a decline in our own faculties for a decline in the times.[25] As the columnist Franklin Pierce Adams pointed out, "Nothing is more responsible for the good old days than a bad memory."

Intellectual culture should strive to counteract our cognitive biases, but all too often it reinforces them. The cure for the Availability bias is quantitative thinking, but the literary scholar Steven Connor has noted that "there is in the arts and humanities an exceptionless consensus about the encroaching horror of the domain of number."[26] This "ideological rather than accidental innumeracy" leads writers to notice, for example, that wars take place today and wars took place in the past and to conclude that "nothing has changed"—failing to acknowledge the difference between an era with a handful of wars that collectively kill in the thousands and an era with dozens of wars that collectively killed in the millions. And it leaves them unappreciative of systemic processes that eke out incremental improvements over the long term.

Nor is intellectual culture equipped to treat the Negativity bias. Indeed, our vigilance for bad things around us opens up a market for professional curmudgeons who call our attention to bad things we may have missed. Experiments have shown that a critic who pans a book is perceived as more competent than a critic who praises it, and the same may be true of critics of society.[27] "Always predict the worst, and you'll be hailed as a prophet," the musical humorist Tom Lehrer once advised. At least since the time of the Hebrew prophets, who blended their social criticism with forewarnings of disaster, pessimism has been equated with moral seriousness. Journalists believe that by accentuating the negative they are discharging their duty as watchdogs, muckrakers, whistleblowers, and afflicters of the comfortable. And intellectuals know they can attain instant gravitas by pointing to an unsolved problem and theorizing that it is a symptom of a sick society.

The converse is true as well. The financial writer Morgan Housel has observed that while pessimists sound like they're trying to help you, optimists sound like they're trying to sell you something.[28] Whenever someone offers a solution to a problem, critics will be quick to point out that it is not a panacea, a silver bullet, a magic bullet, or a one-size-fits-all solution; it's just a Band-Aid or a quick technological fix that fails to get at the root causes and will blow back with side effects and unintended consequences. Of course, since nothing is a panacea and everything has side effects (you can't do just one thing), these common tropes are little more than a refusal to entertain the possibility that anything can ever be improved.[29]

Complaining about modern society can be a backhanded way of putting down one's rivals—for academics to feel superior to businesspeople, businesspeople to feel superior to politicians, and so on.

Pessimism among the intelligentsia can also be a form of one-upmanship. A modern society is a league of political, industrial, financial, technological, military, and intellectual elites, all competing for prestige and influence, and with differing responsibilities for making the society run. Complaining about modern society can be a backhanded way of putting down one's rivals—for academics to feel superior to businesspeople, businesspeople to feel superior to politicians, and so on. As Thomas Hobbes noted in 1651, "Competition of praise inclineth to a reverence of antiquity. For men contend with the living, not with the dead." Pessimism, to be sure, has a bright side. The expanding circle of sympathy makes us concerned about harms that would have passed unnoticed in more callous times. Today we recognize the Syrian civil war as a humanitarian tragedy. The wars of earlier decades, such as the Chinese Civil War, the partition of India, and the Korean War, are seldom remembered that way, though they

killed and displaced more people. When I grew up, bullying was considered a natural part of boyhood. It would have strained belief to think that someday the president of the United States would deliver a speech about its evils, as Barack Obama did in 2011. As we care about more of humanity, we're apt to mistake the harms around us for signs of how low the world has sunk rather than how high our standards have risen.

But relentless negativity can itself have unintended consequences, and recently a few journalists have begun to point them out. In the wake of the 2016 American election, the *New York Times* writers David Bornstein and Tina Rosenberg reflected on the media's role in its shocking outcome:

> Trump was the beneficiary of a belief—near universal in American journalism—that "serious news" can essentially be defined as "what's going wrong." ... For decades, journalism's steady focus on problems and seemingly incurable pathologies was preparing the soil that allowed Trump's seeds of discontent and despair to take root. ... One consequence is that many Americans today have difficulty imagining, valuing or even believing in the promise of incremental system change, which leads to a greater appetite for revolutionary, smash-the-machine change.[30]

Bornstein and Rosenberg don't blame the usual culprits (cable TV, social media, late-night comedians) but instead trace it to the shift during the Vietnam and Watergate eras from glorifying leaders to checking their power—with an overshoot toward indiscriminate cynicism, in which everything about America's civic actors invites an aggressive takedown.

If the roots of progressophobia lie in human nature, is my suggestion that it is on the rise itself an illusion of the Availability bias? Anticipating the methods I will use in the rest of the book, let's look at an objective measure. The data scientist Kalev Leetaru applied a technique called sentiment mining to every article published in the *New York Times* between 1945 and 2005, and to an archive of translated articles and broadcasts from 130 countries between 1979 and 2010. Sentiment mining assesses the emotional tone of a text by tallying the number and contexts of words with positive and negative connotations, like *good, nice, terrible,* and *horrific.* Figure 1 shows the results. Putting aside the wiggles and waves that reflect the crises of the day, we see that the impression that the news has become more negative over time is real. The *New York Times* got steadily more morose from the early 1960s to the early 1970s, lightened up a bit (but just a bit) in the 1980s and 1990s, and then sank into a progressively worse mood in the first decade of the new century. News outlets in the rest of the world, too, became gloomier and gloomier from the late 1970s to the present day.

•

What is progress? You might think that the question is so subjective and culturally relative as to be forever unanswerable. In fact, it's one of the easier questions to answer.

Most people agree that life is better than death. Health is better than sickness. Sustenance is better than hunger. Abundance is better than poverty. Peace is better than war. Safety is better than danger. Freedom is better than tyranny. Equal rights are better than bigotry and discrimination. Literacy is better than illiteracy. Knowledge is better than ignorance. Intelligence is better than dull-wittedness. Happiness is better than misery. Opportunities to enjoy family, friends, culture, and nature are better than drudgery and monotony.

All these things can be measured. If they have increased over time, that is progress.

Granted, not everyone would agree on the exact list. The values are avowedly humanistic, and leave out religious, romantic, and aristocratic virtues like salvation, grace, sacredness, heroism, honor, glory, and authenticity. But most would agree that it's a necessary start. It's easy to extoll transcendent values in the abstract, but most people prioritize life, health, safety, literacy, sustenance, and stimulation for the obvious reason that these goods are a prerequisite to everything else. If you're reading this, you are not dead, starving, destitute, moribund, terrified, enslaved, or illiterate, which means that you're in no position to turn your nose up at these values—or to deny that other people should share your good fortune.

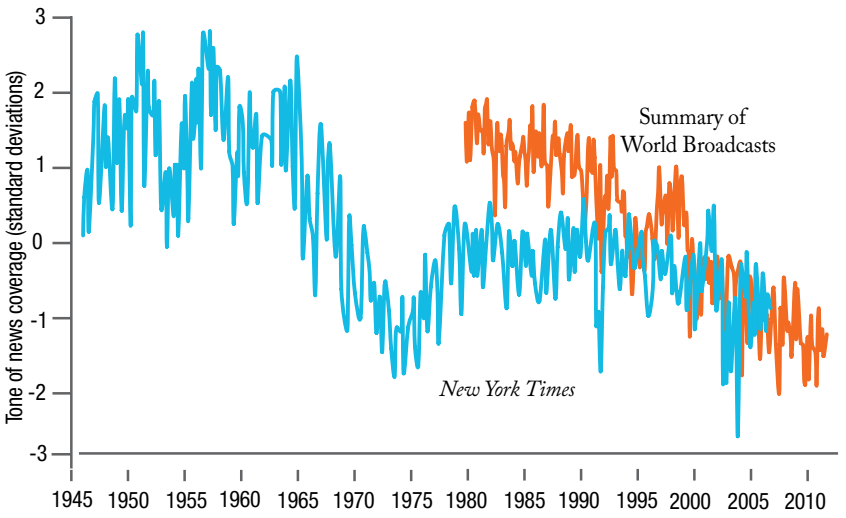


Figure 1: Tone of the news, 1945–2010. Source: Leetaru 2011. Plotted by month, beginning in January.

As it happens, the world does agree on these values. In the year 2000, all 189 members of the United Nations, together with two dozen international organizations, agreed on eight Millennium Development Goals for the year 2015 that blend right into this list.[31]

And here is a shocker: *The world has made spectacular progress in every single measure of human well-being.* Here is a second shocker: *Almost no one knows about it.*

Information about human progress, though absent from major news outlets and intellectual forums, is easy enough to find. The data are not entombed in dry reports but are displayed in gorgeous Web sites, particularly Max Roser's *Our World in Data,* Marian Tupy's *HumanProgress,* and Hans Rosling's *Gapminder.* (Rosling learned that not even swallowing a sword during a 2007 TED talk was enough to get the world's attention.) The case has been made in beautifully written books, some by Nobel laureates, which flaunt the news in their titles—*Progress, The Progress Paradox, Infinite Progress, The Infinite Resource, The Rational Optimist, The Case for Rational Optimism, Utopia for Realists, Mass Flourishing, Abundance, The Improving State of the World, Getting Better, The End of Doom, The Moral Arc, The Big Ratchet, The Great Escape, The Great Surge, The Great Convergence.*[32] (None was recognized with a major prize, but over the period in which they appeared, Pulitzers in nonfiction were given to four books on genocide, three on terrorism, two on cancer, two on racism, and one on extinction.)

Learning about human progress is not an exercise in optimism, cheeriness, or looking on the bright side: it's a matter of accuracy, of understanding the world as it really is.

Notes

1. Herman 1997, p. 7, also cites Joseph Campbell, Noam Chomsky, Joan Didion, E. L. Doctorow, Paul Goodman, Michael Harrington, Robert Heilbroner, Jonathan Kozol, Christopher Lasch, Norman Mailer, Thomas Pynchon, Kirkpatrick Sale, Jonathan Schell, Richard Sennett, Susan Sontag, Gore Vidal, and Gary Wills.

2. Nisbet 1980/2009, p. 317.

3. The optimism gap: McNaughton-Cassill and Smith 2002; Nagdy and Roser 2016b; Veenhoven 2010; Whitman 1998.

4. EU Eurobarometer survey results, reproduced in Nagdy and Roser 2016b.

5. Survey results from Ipsos 2016, "Perils of Perception (Topline Results)," 2013, https://www.ipsos.com/sites/default/files/migrations/en-uk/files/Assets/Docs/Polls/ipsos-mori-rss-kings-perils-of-perception-topline.pdf, graphed in Nagdy and Roser 2016b.

6. Dunlap, Gallup, and Gallup 1993, graphed in Nagdy and Roser 2016b.

7. J. McCarthy, "More Americans Say Crime Is Rising in U.S.," *Gallup.com*, October 22, 2015, http://www.gallup.com/poll/186308/americans-say-crime-rising.aspx.

8. World is getting worse: Majorities in Australia, Denmark, Finland, France, Germany, Great Britain, Hong Kong, Norway, Singapore, Sweden, and the United States; also Malaysia, Thailand, and the United Arab Emirates. China was the only country in which more respondents said the world was getting better than said it was getting worse. YouGov poll, January 5, 2016, https://yougov.co.uk/news/2016/01/05/chinese-people-are-most-optimistic-world/. The United States on the wrong track: Dean Obeidallah, "We've Been on the Wrong Track Since 1972," *Daily Beast,* November 7, 2014, http://www.pollingreport.com/right.htm.

9. Source of the expression: B. Popik, "First Draft of History (Journalism)," *BarryPopik.com,* http://www.barrypopik.com/index.php/new_york_city/entry/first_draft_of_history_journalism/.

10. Frequency and nature of news: Galtung and Ruge 1965.

11. Availability heuristic: Kahneman 2011; Slovic 1987; Slovic, Fischof, and Lichtenstein 1982; Tversky and Kahneman 1973.

12. Misperceptions of risk: Ropeik and Gray 2002; Slovic 1987. Post-*Jaws a*voidance of swimming: Sutherland 1992, p. 11.

13. If it bleeds, it leads (and vice versa): Bohle 1986; Combs and Slovic 1979; Galtung and Ruge 1965; Miller & Albert 2015.

14. ISIS as "existential threat": Poll conducted for *Investor's Business Daily* by TIPP, March 28–April 2, 2016, http://www.investors.com/politics/ibdtipp-poll-distrust-on-what-obama-does-and-says-on-isis-terror/.

15. Effects of newsreading: Jackson 2016. See also Johnston and Davey 1997; McNaughton-Cassill 2001; Otieno, Spada, and Renkl 2013; Ridout, Grosse, and Appleton 2008; Unz, Schwab, and Winterhoff-Spurk 2008.

16. Quoted in J. Singal, "What All This Bad News Is Doing to Us," *New York,* August 8, 2014.

17. Decline of violence: Eisner 2003; Goldstein 2011; Gurr 1981; Human Security Centre 2005; Human Security Report Project 2009; Mueller 1989, 2004; Payne 2004.

18. Solutions create new problems: Deutsch 2011, pp. 64, 76, 350; Berlin 1988/2013, p. 15.

19. Deutsch 2011, p. 193.

20. Thick-tailed distributions: See chapter 19, and, for more detail, Pinker 2011, pp. 210–22.

21. Negativity bias: Baumeister, Bratslavsky, et al. 2001; Rozin and Royzman 2001.

22. Personal communication, 1982.

23. More negative words: Baumeister, Bratslavsky, et al. 2001; Schrauf and Sanchez 2004.

24. Rose-tinting of memory: Baumeister, Bratslavsky, et al. 2001.

25. Illusion of the good old days: Eibach and Libby 2009.

26. Connor 2014; see also Connor 2016.

27. Snarky book reviewers sound smarter: Amabile 1983.

28. M. Housel, "Why Does Pessimism Sound So Smart?" *Motley Fool,* January 21, 2016.

29. Similar points have been made by the economist Albert Hirschman (1991) and the journalist Gregg Easterbrook (2003).

30. D. Bornstein and T. Rosenberg, "When Reportage Turns to Cynicism," *New York Times,* November 15, 2016. For more on the "constructive journalism" movement, see Gyldensted 2015, Jackson 2016, and the magazine *Positive News* (www.positive.news).

31. The UN Millennium Development Goals are: 1. To eradicate extreme poverty and hunger. 2. To achieve universal primary education. 3. To promote gender equality and empower women. 4. To reduce child mortality. 5. To improve maternal health. 6. To combat HIV/AIDS, malaria, and other diseases. 7. To ensure environmental sustainability. 8. To develop a global partnership for [economic] development.

32. Books on progress (in order of mention): Norberg 2016, Easterbrook 2003, Reese 2013, Naam 2013, Ridley 2010, Robinson 2009, Bregman 2017, Phelps 2013, Diamandis and Kotler 2012, Kenny 2011, Bailey 2015, Shermer 2015, DeFries 2014, Deaton 2013, Radelet 2015, Mahbubani 2013.

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Trauma and Taboo

Traumatic Memories Are Alive and Well and Eating Your Innards Out

The name may have changed, but recovered memories haven't gone away. They're claimed to be destroying our minds and bodies. The reason has more to do with taboo than trauma.

ROBERT STERN

Corticeps is a nasty but fascinating genus of fungus that burrows into the bodies and brains of insects. As fungal enzymes dissolve and disrupt neurotransmission, the infected insect's behavior is changed, and it makes itself available to be eaten and eventually excreted by predators, thereby increasing the fungus's own chances of propagation. Lots of zombie films base their plots on Corticeps-like pathogens infecting humans, munching away on their brains, and changing their behaviors to spread more pathogens, making more zombies. The films are mostly silly and occasionally entertaining.

There's a subset of psychotherapy called "Trauma Therapy." It argues that childhood abuse is the human equivalent of Corticeps. Worse, in fact. Trauma therapy argues that childhood abuse not only eats out the brains of its victims, changing their behaviors, but their bodies as well. Like zombie films, the research is mostly silly. Unlike the films, the therapy is potentially dangerous.

Trauma Therapy is the phoenix reborn from the ashes of Freud's Child Seduction Theory, which presumed that childhood sexual abuse, buried away in the unconscious, was responsible for subsequent mental illnesses. The mechanism for the seduction theory's amnesia was repression—the belief that those unacceptable memories of childhood sexual molestation could be buried in young minds, eating away at mind and body, and emerging as mental illnesses in adulthood. Even Freud didn't believe it and abandoned the theory (Freud 1897).

But belief in a connection between childhood sexual abuse and repression wouldn't die. In America, therapists trained in Freudian, semi-Freudian, or quasi-Freudian techniques kept the discarded theory alive. During the 1980s and 1990s, repressed memories of childhood abuse became the etiological foundation of Multiple Personality Disorder, a disorder said to be obvious in its "hiddenness." Therapists, whether professional, lay, or religious, all set out to find their clients' different personalities and uncover the repressed memories of childhood abuse—usually in numbers inversely proportional to the therapist's level of education.

After numerous lawsuits and professional licenses were lost during the Memory Wars of the 1980s and 1990s, the terms *repression* and *Multiple Personality Disorder* (MPD) were finally put to rest by the American Psychiatric Association. But, unfortunately, the underlying beliefs remain.

Below is the pre-war definition of MPD in the *Diagnostic and Statistical Manual Third Edition-Revised* (*DSM-IIIR)*, the "bible of psychiatry" (1987):

> The essential feature of this disorder [MPD] is the existence within the person of two or more distinct personalities or personality states. Personality is here defined as a relatively enduring pattern of perceiving, relating to, and thinking about the environment and one's self that is exhibited in a wide range of important social and personal contexts. … At least two of the personalities, at some time and recurrently, take full control of the person's behavior.

You'd be forgiven for failing to understand the difference between MPD and Dissociative Identity Disorder (DID), whose definition in the next edition, the *DSM-IV* (1990) was:

> The presence of two or more distinct identities or personality states (each with its own relatively enduring pattern of perceiving, relating to, and thinking about the environment and self). … At least two of these identities or personality states recurrently take control of the person's behavior.

The etiology of both was trauma, almost always childhood sexual abuse. While Freudians would have claimed the memories were repressed, today's therapists claim that the memories have been *dissociated*. The difference? Repression is an *isolation* of traumatic memory from consciousness, but dissociation is a *separation* of traumatic memory from

consciousness. It's a subtle distinction. Oddly, no one's ever been able to adequately explain why Multiple Personality Disorder was never classified as a personality disorder.

Trauma Therapy is the phoenix reborn from the ashes of Freud's Child Seduction Theory, which presumed that childhood sexual abuse, buried away in the unconscious, was responsible for subsequent mental illnesses.

Repressed Memories, Still Munchin' Away

MPD/DID's status has waned in psychiatric literature, and when (if rarely) the topic is discussed at conferences, it tends to be met by attendees looking around the room, checking the dirt under their fingernails, or dusting the dandruff off their jackets.

Post-Traumatic Stress Disorder (PTSD), however, still maintains diagnostic respectability. And it has trauma in its name. Previously classified as an anxiety disorder—assessing the patient's heightened responses to a perceived and past stressor—PTSD is now in a new category, Trauma- and Stressor-Related Disorders, which emphasizes the stressor over the patient. Adding to the confusion, PTSD now comes both with and without dissociative symptoms. This hybrid PTSD merges PTSD with the Dissociative Disorders.

But joining dissociation and PTSD through trauma presents a problem in logic and consistency. PTSD is said to be caused by exposure to traumatic events: war, violence, assault, etc. Its symptoms include intrusive memories, re-experiencing the event(s), avoidance of similar situations, and increased startle response.

Dissociative disorders such as MPD/DID also claim to be the result of traumatic events—mostly child sexual and physical abuse, which has somehow been hidden from consciousness. The problem? PTSD is a disease whose etiology is a trauma so severe it cannot be forgotten, but dissociation is a disease whose etiology is a trauma so severe it cannot be remembered!

Mind-Munching Memories

Hundreds of papers have been published on the effects of childhood abuse on adults. Early research began with the hippocampus, a part of the brain that consolidates senses, thoughts, and emotions into memories. Trauma researchers measured hippocampal volumes of victims and controls. Finding differences, they proclaimed that those differences were the result of trauma—not bothering to examine anything else. Sometimes the right hippocampus was affected, sometimes the left, and sometimes both. In fact, hippocampal size is now known to change over time and is dependent on genetics, blood flow, medication, age, mood, and alcohol and drug use (Jelicic and Merckelbach 2004). Even exercise can affect hippocampal size, and thus it's hardly specific to trauma.

With their main hope of causally relating trauma to the hippocampus found wanting, traumatologists set out to discover brain damage from child trauma in other areas of the brain. Scampering all around and through gray and white matter, they found volumetric differences between victims and controls. Purported results of trauma have included decreased sizes of the amygdala, the lateral prefrontal cortex, the medial prefrontal cortex, the motor cortex, the visual cortex, the cingulate gyrus, the hypothalamus, gray matter thickness, the cingulate gyrus, the corpus callosum, the pituitary, etc. Differences in neurotransmitter measurements of serotonin, dopamine, monoamine oxidase, vasopressin, and others have also been tallied and published.

The sum of all of these papers might lead the reader to accept that a causal connection had been found between childhood trauma and adult brain pathology. However, the problem with most of these papers mirrors those of the hippocampal studies; i.e., brains are dynamic—they change over time, depending on circumstances. There are a host of other problems, beginning with whether the purported traumas were verified or merely accepted at face value.

Mostly the latter. Or whether the subjects were male or female. Mostly the latter.

Body Munching Memories

A second group of articles, published in psychology or therapy journals rather than medical journals, implies that childhood trauma is a factor in adult medical disorders. The diseases include osteoarthritis, rheumatoid arthritis, chronic fatigue, fibromyalgia, psoriasis, alopecia, COPD, cancer, asthma, congestive heart failure, hypertension, heart attacks, arterial thickening, hypothyroidism, diabetes, obesity, dyslipidemia, breast cancer, irritable bowel disease, and at least a dozen others. The causal mechanism(s) through which childhood trauma causes, or at least exacerbates, the severity of any of these disparate adult diseases remains unexplained, although epigenetics and DNA methylation are the current popular targets (Guggisberg 2017). Physicians who specialize in treating those disorders would probably be surprised to learn their work has mostly been in vain and that what their patients really need is a hefty dose of trauma therapy.

Societal Munching Memories

A third group of articles links childhood abuse and trauma to current social malfunctioning: decreased social status, antisocial behavior, increased incarceration, parental fatigue, smoking, drug and alcohol use, even subsequent rape (both victim and perpetrator) are some of the reports. Some papers even note a correlation between childhood abuse and alien abduction (Powers 1994).

Psychiatric Munching Memories

The fourth and largest group of publications correlates childhood trauma with current or past psychiatric disorders. The list includes just about every one of the 600 plus diagnoses in the *DSM* from anxiety to schizophrenia, although DID is still the most popular.

PTSD is a disease whose etiology is a trauma so severe it cannot be forgotten, but dissociation is a disease whose etiology is a trauma so severe it cannot be remembered!

Like the other categories, these correlation papers set out to prove the connection between child abuse and mental illness—allowing for nothing else. However, despite all the published correlations, the world consists of more than abuse and trauma. People have genes and environments and histories and behaviors and misbehaviors and friends who misbehave and accidents and love affairs gone sour, as well as environmental pathogens and bacteria and viruses and fungi. Try hard enough and you can find a correlation between two of just about anything, even Cordiceps and zombies[1] (Doan et al. 2017). But unless all variables can be studied and causal mechanisms can be shown, the myriad correlations amount to little more than speculation. Or wishful thinking. Mostly the latter.

Taboo

Why do so many therapists insist on pointing to childhood (sexual) abuse as the root cause of so many diseases and dysfunctions? And why is lax research methodology so typical of abuse literature? The answer lies not in studies of research or medicine or psychology or even therapy but rather in those of morality.

It's always helpful to get an overview of childhood abuse in America, which has been provided by the Childhood Protective Services (CPS) statistics for many years. Below in Table 1 are the statistics from 1997 and 2015 from CPS (Childhood Protective Services 2016). These are strictly founded cases (absolute numbers in parentheses). This is without doubt an under-representation since the numbers only reflect founded cases; however, it provides an overview of how abuse cases are broken down in the United States.

But compare the CPS stats to the abuse research literature (Google, PubMed, and Google Scholar) (Table

	Child Protective Services[2]	
1997 (716,000)		2015 (683,000)
	Childhood Neglect	
60 percent		75.3 percent
	Childhood Physical Abuse	
4 percent		17.2 percent
	Childhood Sexual Abuse	
12 percent		8.4 percent

Table 1. Incidence of different types of child abuse reported to Child Protective Services, 1997 and 2015.

2) and you get an entirely different picture.

Why do traumatologists obsess over childhood sexual abuse? It's not just because pain was inflicted on someone, but because the person inflicting the pain achieved pleasure through that someone's pain. As British historian Thomas Babington Macaulay wisely recognized, "The Puritan hated bear-baiting not because it gave harm to the bear, but because it gave pleasure to the spectator." If you think Macaulay was just being witty and sarcastic, compare his 1849 epigram to the Veterans Administration's current unwitty and unsarcastic definition of child sexual abuse, or CSA (Whelan and Bartlett 2016):

> Child sexual abuse includes a wide range of sexual behaviors that take place between a child and an older child or adult. These sexual behaviors are intended to erotically arouse the older person, generally without consideration for the reactions or choices of the child and without consideration for the effects of the behavior upon the child.

The association of CSA with long-term medical, psychiatric, and social pathologies is based on retrospective, *post hoc* rationalizations and low p-values. Important variables are excluded. In nearly every paper, the conclusion was that CSA was the major, if not the only, factor examined in long-term physical, mental, or emotional harm to the subjects—even when no evidence of harm could be shown.

For example, the majority of studies on smoking state that most people take up smoking because their close family or friends smoke. This result holds across the world in epidemiologic studies (Islam and Johnson 2005; Garcia-Rodriguez et al. 2010; Wiecha et al. 1998). But if you browse the abuse literature, the only variable studied is—you guessed it—abuse.

This predetermined belief reveals a taboo—a powerful social or religious custom placing a prohibition on certain behaviors. Break a taboo and society reacts with moral outrage. Researchers Gutierrez, Giner-Sorolla, and Russell ran a series of elegant studies on taboo-breaking behaviors at the University of Kent (Russell and Giner-Sorolla 2011; Gutierrez and Giner-Sorolla 2007). Their studies demonstrated that the initial emotions elicited from broken taboos are anger and disgust. A taboo that has been violated provokes society to presume that harm has been caused, even if no harm can be objectively demonstrated. The damage is moral—not just to the abused but to the society itself.

This predetermined belief reveals a taboo—a powerful social or religious custom placing a prohibition on certain behaviors. Break a taboo and society reacts with moral outrage.

The hundreds of CSA studies reviewed in PubMed exemplify the results of a broken taboo—anger and moral outrage. Whether or not CSA can be associated with long-term physical or psychological damage to the victim still remains unanswered; the research is overwhelmingly poor. But what is undoubtedly clear is that anger and moral outrage fuel the published research. If there is still any doubt that this is the result of a powerful taboo, recall the fate of Bruce Rind, Phillip Bauserman, and Robert Tromovitch.

In July 1998, Rind, Tromovich, and Bauserman published the results of their research in *Psychological Bulletin* (Rind et al. 1998), a meta-analysis of over 35,000 college students—women and men—who reported CSA. They could find no evidence of long-term psychological harm, with the exception of some mild depressive symptoms. And when family dysfunctions were factored out, the students appeared to be psychologically normal and healthy. This should have been considered good news—great news, in fact. If the findings were correct, victims of CSA would recover and get on with their lives as normal women and men. It would be like learning that your child didn't contract polio; you ought to be overjoyed.

Instead, the response from the therapeutic community was outrage. The

Google	PubMed	Google Scholar
	Childhood Neglect	
458,000 (5.3 percent)	532 (16.2 percent)	7,670 (6.4 percent)
	Childhood Physical Abuse	
237,000 (2.8 percent)	349 (10.6 percent)	11,000 (10.2 percent)
	Childhood Sexual Abuse	
7,900,000 (91.9 percent)	2,401 (73.2 percent)	102,000 (83 percent)

Table 2. Incidence of child abuse by source.

meta-analysis was furiously denounced—not only by therapists, psychologists, and psychiatrists, but also by both APAs (American Psychological and Psychiatric Associations), who published position papers opposing the findings. Reports of the conclusions made national headlines, and on July 12, 1999, by a vote of 355 to 0, with thirteen abstentions, the research was condemned by the House of Representatives. The Senate unanimously condemned it on July 30 (Lilienfeld 2002).

Rind, Bauserman, and Tromovitch's meta-analysis is the only scientific research in U.S. history to have ever earned the dubious honor of congressional condemnation. It was subsequently learned that almost none of the congressmen had even bothered to read the article. But, despite the uproar from therapists and the public, and the condemnation from the Congress, their findings have held. The paper was reviewed by the American Association for the Advancement of Science, and the entire meta-analysis was even rerun at the University of Montana (Ulrich et al. 2005) with similar results. (For more on the Rind et al. study, see "Damaged Goods," by Margaret A. Hagen in the January/February 2001 issue of SI and "When Scientific Evidence is the Enemy" by Elizabeth Loftus in the November/December 2001 issue of SI.)

What was clear was that most people in the therapy professions wanted, perhaps even *needed*, the abused women and men to become damaged and to remain damaged. Therapists reacted with moral outrage when no long-term harm could be shown. Why? Because long-term damage would justify the moral outrage and anger, and thus maintain the taboo. Without damage, the justification for the taboo is weakened along with the need for treatment.

Traumatologists have endeavored to keep the taboo strong by publishing papers that seek out associations between child abuse and any number of disorders. Some have even manipulated data to justify the predetermined moral conclusion: childhood abuse results in long-term damage to the victim. That's strong evidence of a powerful social taboo.

Not All Abuse Is Created Equal

It's a truism that childhood sexual abuse—or any abuse for that matter—ought to be prevented. But there's abuse, and then there's abuse. Abuse is a catch-all word that differs in type and severity and, like paint, it covers a multitude of sins. Being insulted is not the same as being knifed or shot. Hearing a distasteful joke about race or sex is not the same as being lynched or raped. Yet all of them are labeled abuse. The responses of the afflicted, ranging from disappointment to death, are all labeled trauma. Just as the word that means everything means nothing, so abuse and trauma have lost any definition and now mean essentially nothing.

Therapy, if necessary (and that's a big *if*), ought to be tailored accordingly. Certainly different types of abuse can be harmful and persist for years. Some can even be lethal. But in most cases people can and will recover *if allowed to do so*. That should be the goal of trauma therapy: to help people recover from their problems and get on with their lives. They don't need to be continuously reminded of their traumas. They don't need therapists to ascribe their adult illnesses—physical, mental, or emotional—to their abuse in childhood. And they certainly don't need long-term therapy to reinforce that myth. It would be tantamount to turning them into zombies—eaten away from the inside out.

Notes

1. Recently, sixty cases of Cordiceps ingestion and poisoning, including one death, were discovered in Vietnam. "Zombie" symptoms, which included agitated delirium, hallucinations, somnolence, and coma, occurred within one hour of ingestion. Patients were examined, labs drawn, and analyses performed. Ibotenic acid was identified as the toxic culprit.

2. Cases in which there is more than one type of abuse are counted only once.

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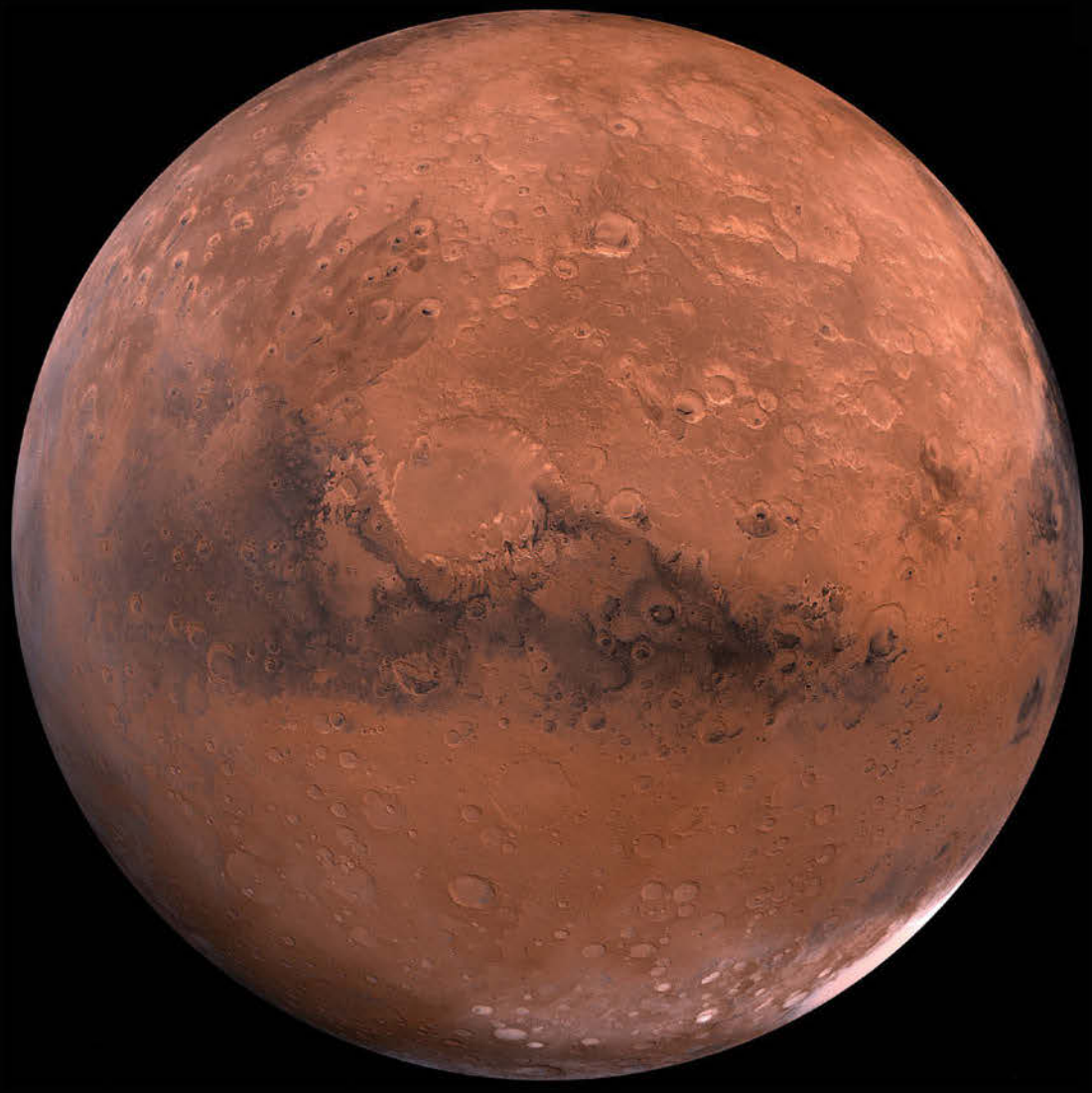
Percival Lowell and the Canals of Mars

The ‘canals’ of Mars don’t exist, and they never did; yet they were repeatedly reported and defended as scientific realities by many great astronomers. Why?

MATTHEW J. SHARPS



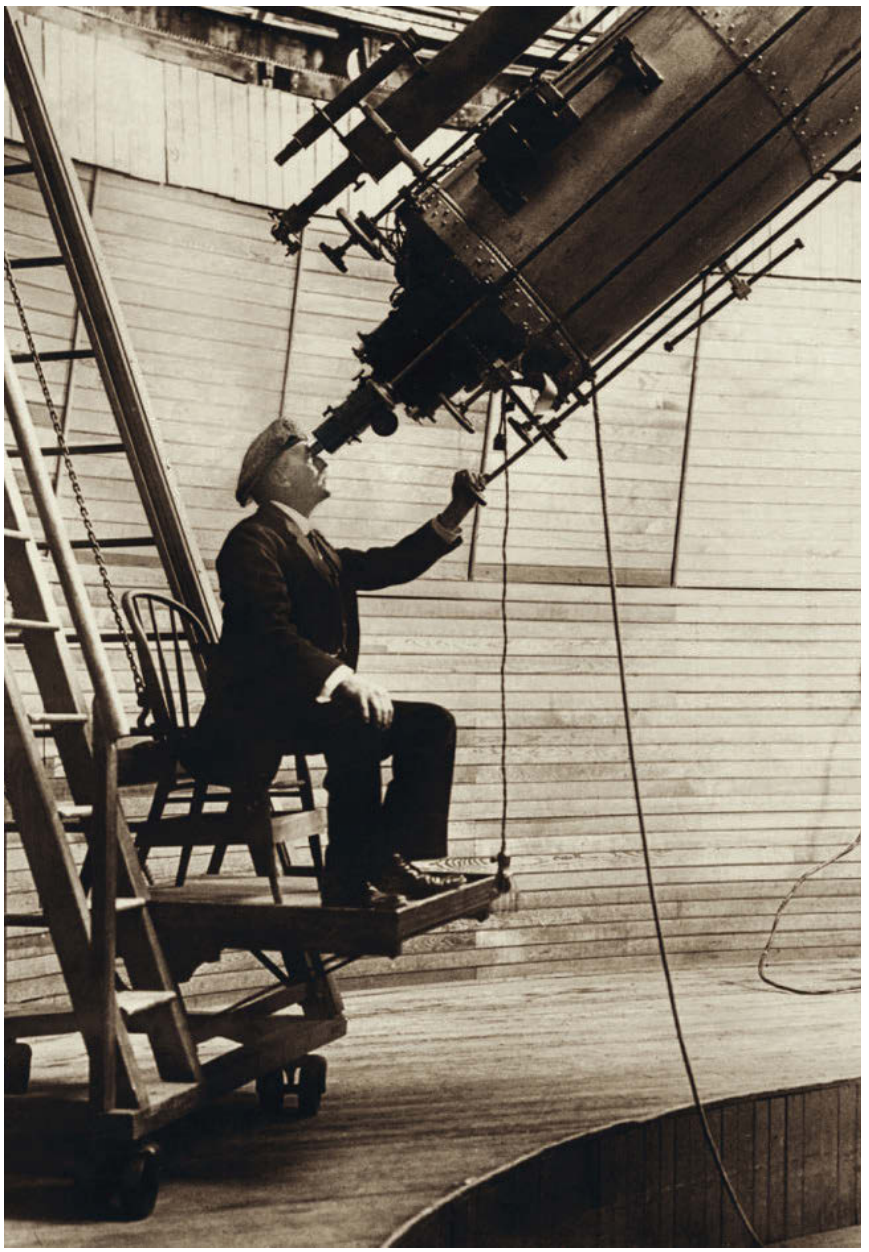
The planet Mars has always fascinated humanity. In fact, it seems to interest us considerably more than most things in the night sky.

This makes sense; Mars is often not only clearly visible but conspicuously red like blood. So many ancient societies associated Mars with war, always of considerable interest to the human species. Mars appeals to us both as a physical object for observation and as a lure for mythological speculation.

There is a duality here. On the one hand, there is the visible planet; the red coloration reflects its geology. On the other hand, there is the Mars of interpretation, whose red color reflects its attributional warlike nature; this says a lot more about human psychology than it does about the planet Mars itself.

The red planet causes us to observe and to speculate.

Speculation. That's where the problems come in. There is physical reality, and there is interpretation; and it is frequently the interpretation, rather than the reality, that seizes the attention of human beings. Our brains are remarkably predisposed to the interpretation of objective physical reality in psychological, self-referential terms. Unfortunately, these terms are frequently just plain wrong.



Percival Lowell in 1914, observing Venus in the daytime with the 24-inch (61 cm) Alvan Clark & Sons refracting telescope at Flagstaff, Arizona.

Examples of this are legion. In previous articles in SI, my coauthors and I have discussed ordinary objects that have metamorphosed, in the minds of their observers, into nonexistent phenomena ranging from UFOs to Bigfoot, and we have found specific patterns of mental processing that contribute directly to these misinterpretations (e.g., Sharps et al. 2016). In the more prosaic but more sinister worlds of eyewitness memory and officer-involved shootings, we have frequently found innocuous things such as power tools being transformed, psychologically, into far less innocuous firearms (e.g., Sharps 2017). It is very clear that our brains can lead us to see meaningful patterns where none actually exist and that we may extrapolate what we believe about a given perception to the perception itself. We tend to interpret what we see in terms of what we *believe*; this brings us back to the planet Mars.

Mars was the special focus of Percival Lowell, an important pioneer in planetary astronomy. Using his own considerable wealth, he created the great observatory at Flagstaff, Arizona. Lowell's computations there led ultimately to Clyde Tombaugh's discovery of Pluto, and Lowell's financial and intellectual support led to a literally stellar progression of Lowell Observatory discoveries to the present day. Many of his observations, and those of other scientists at the Observatory, have proven startlingly accurate (e.g., Schindler 2016).

Some of his other observations, however, present problems.

One of Lowell's most important discoveries, in his opinion, was finding canals on the surface of Mars. These long, straight, clearly artificial irrigation systems were ubiquitous. For Lowell, the dry landscape of Mars quite literally supported an intelligent race of beings with something like civil engineering degrees who were

transporting water all over the place in their canals.

It wasn't just Lowell. Schiaparelli saw canals, or at least ditches (*canali*). Schiaparelli's ditches were long and straight and rectilinear, completely failing to obey the laws of perspective on the Martian planetary spheroid, but he saw and reported them anyway. Flammarion believed in canals, although he was also big on vegetation on the moon as well, so we might want to be a little careful there. Douglas, Lowell's assistant, also saw canals—until he decided they didn't really exist, was fired by Lowell as a result, and went on to invent dendrochronology at the University of Arizona. A lot of professional astronomers saw Martian canals, drew the things, and speculated on their nature.

But there aren't any Martian canals.

That's the problem: there just aren't any damn canals on Mars. Lowell, and many other expert observers, saw them.

But they're just not there.

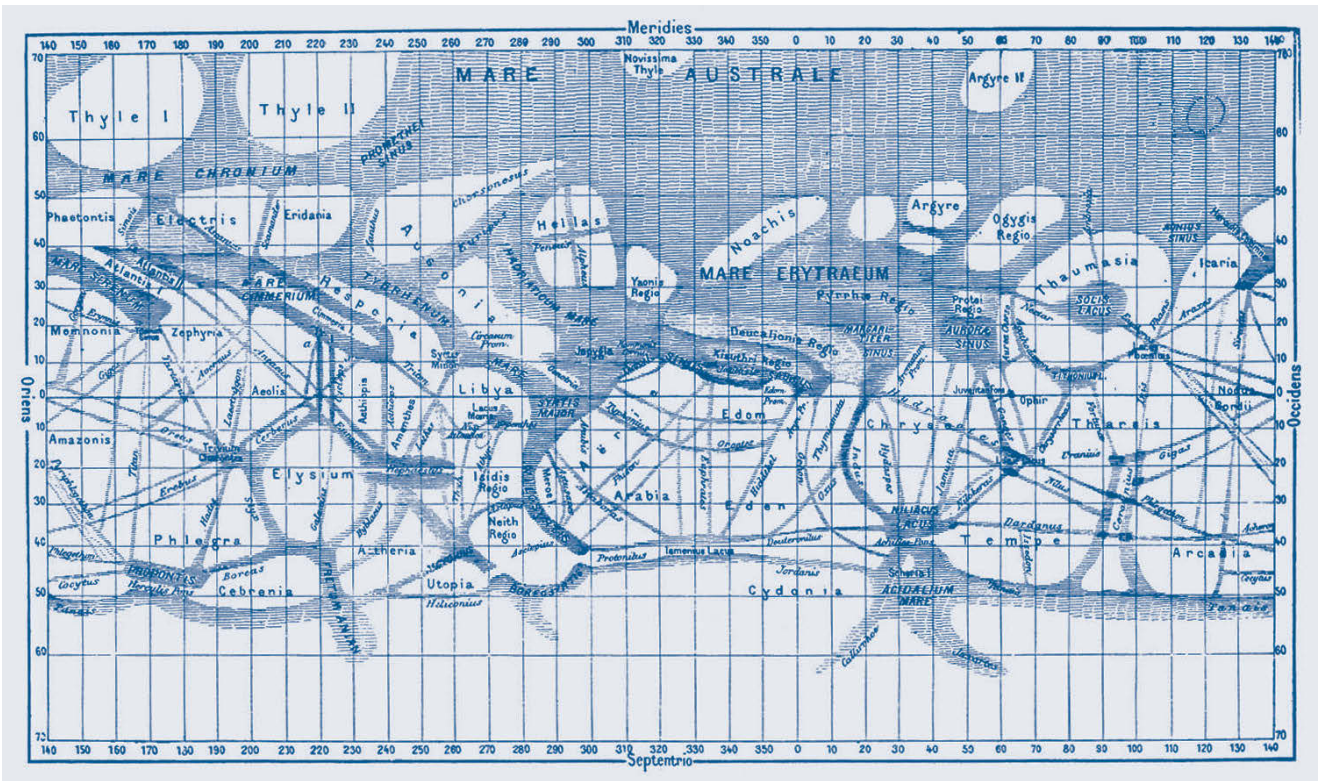
The Mariner spacecraft thoroughly photographed Mars way back in 1964. Mariner found craters, rocks, flat bits and pointy bits, and bits with hills, but it didn't find a single canal. Anywhere.

Mariner did, of course, photograph many Martian surface structures of great interest to planetary astronomers. Lowell saw many of them, half a century earlier, through his excellent telescopes. The man was no fool; some of his drawings of the Martian surface are practically identical, in broad outline, to photographs of the planet taken from the Hubble space telescope. But his canals, drawn with equal clarity, simply don't exist.

A lot of professional astronomers saw Martian canals, drew the things, and speculated on their nature. *But there aren't any Martian canals.*

You might assume that continuing progress in telescope technology would have reduced the observation of these canals in the early years of the twentieth century, but you'd be wrong. I had the honor of examining a number of globes and maps of Mars, held today in the excellent archives at the Lowell Observatory; these very clearly show an increase in the number and complexity of canals as new observations were made and new globes and maps created. Canals became more numerous and elegantly geometric as the observations poured in. Some canals even doubled in perfect parallel, an astonishing phenomenon termed *gemination*; all of this despite the fact that there were never any real canals to begin with.

These nonexistent canals had real staying power. As mentioned earlier, the Mariner orbiter, in 1964, proved that there were no canals on Mars, but I examined a 1969 map in the Lowell archives *that still showed the canals*, in all their impossible rectilinear glory. The ruler-straight lines of the canals were relatively faint, as if the planetary cartographers were somewhat ashamed of these non-existent features, but these completely imaginary ditches were certainly there, in the imaginations and on the maps of scientific areographers. This was five years after Mariner had completely disproved their existence.



Map of Martian "Canals" by Giovanni Schiaparelli

You might assume that continuing progress in telescope technology would have reduced the observation of these canals in the early years of the twentieth century, but you'd be wrong.

How do we explain this? Was Lowell, a fine observational astronomer, hallucinating? And were all the other astronomers who "saw" these bizarre ditches, straight and clear and marching over the Martian landscape, similarly afflicted with bizarre psychological disorders?

Of course not. Hallucinations derive from three sources: organic brain changes, psychosis, and extraordinary levels of stress. Lowell suffered from none of these. Granted, in the 1890s, Lowell left astronomy for four years due to a "nervous" condition, but nobody has ever suggested that he suffered from any of the conditions that produce hallucinations, and he kept seeing canals anyway. So did a lot of less nervous people; his predecessor Schiaparelli observed whole networks of Martian *canali*, as did a number of contemporaneous astronomers, none of whom were psychotic or brain damaged.

What on Mars was going on?

Well, that would be nothing. What was happening was not on Mars at all. The canal phenomenon was very clearly happening on Earth in the minds of the astronomers affected; for whatever reasons, a lot of them had canals on the brain.

Now, if anybody had a right to have canals on the brain, it was the aforementioned Giovanni Schiaparelli. Born a mere twenty-five miles from Canale, Italy, within thirty miles of several major transportation canals and living during a period in which the Suez and Panama Canals were the wonders of the world, it would be rather strange if Schiaparelli did not regard canals as the apotheosis of civilization, even though he himself only referred to the Martian canals as channels or ditches (*canali*). He may very well have had a *mental set* (e.g., Sharps 2017) about such things, a habitual way of looking at the world in canal-related or channel-based terms. This is of course speculation and can never really be anything more, but what we know for certain is that such habits of mind are intensely individualistic, based in our own idiosyncratic experience, and may form one of the first dynamics suggested to explain observation of the nonexistent canals of Mars: *Individual Differences.* Some people see canals. Others don't.

But why does anybody see them in the first place? As mentioned, research

The construction of the Panama Canal

in my laboratory, published primarily in SI (e.g., Sharps et al. 2016), has elucidated some of the psychological dynamics of those who think they see Bigfoot, flying saucers, aliens, and ghosts. One of the things we found in that research was that people generally don't make something out of nothing. In other words, you don't see Bigfoot on a featureless plain; you see an ape-shaped tree stump or something similar, and your brain makes Bigfoot out of it for you. The same brain-based phenomena can also create a Loch Ness monster out of a school of Scottish salmon, a Death Star out of a helicopter with a broken landing light, and so on. These *Gestalt reconfigurations* result from our mental misperception and misinterpretation of real things in the real world—or on the real Mars—and these phenomena are governed by specific psychological laws. These laws are suggested to be a major psychological source of the observation of the canals of Mars.

But how does an astronomer such as Lowell or Schiaparelli maintain his beliefs in these canals, to the point at which, in the face of mounting professional opposition, he sees more and more of them? Human beings are social creatures with the ability to develop strong investments in our ideas and beliefs. This is suggested to be another major source of the Canal phenomenon: *sociocognitive influences*, to be joined with *individual differences* and *Gestalt reconfiguration*.

Based on an intensive review of the relevant literature, and on the observations I was privileged to make in the Lowell Archives and also through Lowell's own 24-inch Clark telescope at the great Lowell Observatory, I submit that the erroneous observations of the canals of Mars can be better understood in terms of these three sets of dynamics.

Individual Differences

The precise influences on Lowell's thinking cannot now be ascertained. But it is clear that in 1901, when Lowell drew an "artificial planet," a mock-up disk designed to evaluate the accuracy of observational drawings, Lowell drew not one but two parallel canals, a "gemination," when in fact there had been "only a broad shading" in that portion of the model (Sheehan 1988). Part of Lowell's family wealth derived from investments in the great canal systems of the eastern United States. These were regarded at the time as among the modern wonders of the world and were used extensively to ship a tremendous variety of goods, including the textiles that were a major business interest of the Lowell clan (see Hoyt 1976 and Sheehan 1988); this was yet another source of his individual affiliation with canals and their builders. In the presence of this influence, he turned a "broad shading" into two very specific, but nonexistent, canals. It might readily be suggested that Lowell, perhaps like Schiaparelli, was something of a victim of a canal-based mental set. This speculation may or may not have merit, but we do know that when Lowell, as an individual, was offered the opportunity to draw a shadow, he drew a hydraulic engineering system.

These individual differences would of course have interacted with the conditions of any given observation—but in what way? In my own work at the Lowell Observatory, I observed both Mars and Jupiter through the great Clark telescope preserved there. Now, I am an aging researcher with very thick glasses, but what I can say is that the observations danced before me very swiftly, the result of atmospheric fluctuation. Sometimes I would seem to see a feature on Mars, and then it was gone, or obscured, within two or three seconds. This type of highly variable, atmospherically based visual fluctuation would certainly have been there for Lowell and his colleagues as well. Obviously their training and experience would have rendered them vastly superior observers to me. But expertise aside, the fact is that brevity of observation limits our precision, in astronomy as in criminal eyewitness identification. Brevity can completely change our interpretation of our observations (e.g., Sharps 2017), whether we think we see a criminal suspect with a gun or a canal on the planet Mars. In short, if we have strong individual psychological reasons to see canals, we will see them if the observational conditions permit them at all. Lowell saw them, to the degree that when his assistant A.E. Douglas questioned these interpretations, he was essentially fired. *Observations are subject to the psychology of the individual interpreting them*; this is a crucial principle that all scientists, in all fields, should consider.

Gestalt Reconfiguration

The astronomer E.M. Antoniadi was rather caustically critical of Lowell in most respects. Although he reported the odd Martian canal himself, he demonstrated, very enthusiastically, that many of the "canals" were in fact the result of observation of a series of surface features: craters, rocks, and so on, arranged by the forces of geology into linear patterns. Lowell, and the other "canal" observers, saw discrete surface features arranged by natural forces into relatively straight lines, and joined them, perceptually, into "canals" (e.g., Sheehan 1988).

Observations are subject to the *psychology of the individual interpreting them*; this is a crucial principle that all scientists, in all fields, should consider.

How is this possible? Gestalt psychology, the venerable theoretical perspective that deals with perceptual and cognitive configuration, provides rather good answers (e.g., King and Wertheimer 2005; Kohler 1947). Consider two of the Gestalt laws of perception, the laws of *closure* and of *good continuation* (see Sharps 1993). When we see objects that are close together, we tend to see them as connected; and when they form contours, lines, or curves, we tend to see them as units. Lowell, and the other canal believers, saw craters and rocks very close together. These astronomers, with their human nervous systems, tended to see these things as

contiguous. The contours thus created frequently formed lines, hence the canals. Contours of disconnected rocks were "closed," perceptually, into solid lines; under brief observation conditions, these lines appeared very solid, and they showed "good continuation" with other discrete features of the Martian surface. These factors would have created, perceptually, the "canals" (Sheehan 1988).

If an astronomer such as Lowell was individually predisposed to see canals and observed them with unavoidable fluctuating brevity, the Gestalt phenomena of closure and good continuation would practically ensure that he would see them, real or not (Sheehan 1988; Sharps 1993; 2017).

The scientist does not lie outside of the natural world. Rather, the scientist is entirely part of that world and is subject to scientific law.

Sociocognitive Factors

In a letter to Lowell's brother, Lowell's assistant, A.E. Douglas, pointed out that the canals might have a psychological origin. Lowell discharged him.

Lowell regarded any psychological explanation for the canals as anathema. He may have seen the psychological idea as psycho*pathological*, rather than as rooted in the normal principles of cognition and perception; whatever the source, he fired Douglas. Lowell had invested enormously, in financial and in psychological terms, in the canals of Mars, and as has been demonstrated many times, strong investment leads to strong beliefs that are difficult to sway even in the presence of contrary evidence. The principle of *cognitive dissonance* (Festinger 1957; Sharps 2017) deals with this rather nicely. Even if a given idea proves to be completely wrong, we tend to hold to it, and even to defend it with relatively incoherent cognitive processing, *if we're sufficiently invested in it* (Festinger 1957).

Lowell had given the canals of Mars everything he had, in terms of a very long-term emotional and financial investment. The canals of Mars, in Lowell's mind, were the greatest discovery of his own observatory. To acknowledge error would have been virtually impossible for him, in view of this investment; he never gave up on his belief in the canals, even and especially in the face of mounting pressure and criticism from his colleagues and his detractors.

Conclusions

The Martian surface is densely covered with features derived from the geological processes of the planet and from astronomical impacts over an enormous span of time. These surface features create a variety of irregularities that are very clear in photographs from spacecraft and from modern telescopes. However, through the telescopes of the early twentieth century, these features would have been much less readily resolved. This relative lack of resolution would have resulted in perceptual and cognitive misinterpretation with reference to the Gestalt principles cited above. This is especially true when the fluctuating brevity of optical astronomical observation is considered and when we further consider the reinforcing factors derived from individual differences and from sociocognitive factors, cementing early interpretations of those observations into a form of cognitive concrete.

It's obviously impossible to perform experiments on the astronomers of the past. But within the realm of theoretical psychology, we can absolutely state that the observation of the canals of Mars demonstrates neither psychopathology nor incompetence on the part of pioneering scientists such as Lowell. Instead, we find an important lesson for our more modern inquiries. The scientist does not lie outside of the natural world. Rather, the scientist is entirely part of that world and is subject to scientific law; in the present case, to elements of the Gestalt laws of perception and cognition and to the laws of related areas of experimental psychology. It is important for all scientists, in all disciplines, to be aware of these essential facts and to use them to exert caution in the interpretation of what might otherwise be interpreted as purely objective observations.

Acknowledgments

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The Curious Question of Ghost Taxonomy

The nature of ghosts remains unknown despite centuries of collective effort by legions of ghost hunters.

BENJAMIN RADFORD

Among the vast constellation of unexplained and Fortean topics, ghosts are by far the most elusive and unknown. Cryptozoologists who search for Bigfoot, for example, have reached a general consensus on what they're looking for: a tall, bipedal, hairy, manlike animal. Not so with the most popular paranormal subject in the world: ghosts.

What are ghost hunters looking for? It's not clear. As Owen Davies notes in his book *The Haunted: A Social History of Ghosts*, historically "Ghosts shared certain characteristics with fairies, angels, and devils, and the tricky task of distinguishing between them often depended on the context in which they appeared: and this in turn changed over the centuries according to religious, philosophical, and scientific developments" (Davies 2007, 13).

Over the years various attempts have been made to classify and categorize ghosts (by early researchers including G.N.M. Tyrrell, Eleanor Sidgwick, and others associated with the Society for Psychical Research and more recently by writers such as Brad Steiger and John Zaffis) usually according to eyewitness reports. Of course there are inherent problems with classifying and categorizing potentially ambiguous and error-prone experiences. This was perhaps not obvious in the late 1800s, but over the past decades, it's become clear from psychology research that sincere people misperceive and misremember events with alarming consistency. Research is only as good as the data, and the testimony and accounts of apparition witnesses simply cannot be taken at face value.

There are a half dozen or so different definitions of ghosts, and there's equal evidence for all of them. Trying to classify inherently unknown entities whose very existence and nature remains unproven is a fool's errand: How many types of ghosts are there? As many as you want there to be.

Many ghost-hunting books begin by boldly asserting that there are a specific number of types of ghosts (curiously the exact number varies somewhat, from two to a half dozen or so). For example, Rich Newman, in his 2011 book *Ghost Hunting for Beginners*, claims that there are three types of hauntings (he offers no source or reference for this, essentially offering a version of "they say ...").

But the simple fact is that no one knows for sure whether ghosts exist, and therefore no one can be sure how many types of ghosts there are. Ghost reports and sightings can of course be catalogued, analyzed, and categorized, but ghosts themselves cannot. This is a basic mistake, confusing a type of *ghost* for a type of *ghost report*; they are not the same thing at all, and ghost hunters confuse the two at their peril. A ghost report is merely a record of something that someone—for whatever reason and under whatever circumstances—could not explain and chose to attribute to an unseen spirit and may or may not reflect an actual ghost appearance.

When sociologist Dennis Waskul and his wife interviewed ghost experiencers for their book *Ghostly Encounters: The Hauntings of Everyday Life*, they found:

> Many participants in this study were not sure that they had encountered a ghost and remained uncertain that such phenomena were even possible, simply because they did not *see* something that approximated the conventional *image* of a "ghost." Instead, many of our respondents were simply convinced that they had experienced something uncanny—something inexplicable, extraordinary, mysterious, or eerie. (Waskul and Waskul 2016, 20)

Thus, we see why defining and explaining ghostly phenomena is slippery and problematic. Many people who will go on record as having a ghostly experience didn't necessarily see anything that most people would recognize as a classic "ghost," and in fact may have had completely different experiences whose only common factor is that they could not be readily explained.

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Disorder in the House

It's difficult to overstate the lack of coherent research methods and assumptions about ghosts within the ghost-hunting communities. A chapter in the book *Ghosts, Spirits & Hauntings* by ghost hunters Larry Flaxman and Marie D. Jones (2011) shows just how disorganized the ghost hunting field is.

Though both authors are clearly believers in the existence of ghosts and the paranormal (Flaxman is senior researcher with fifteen years of experience at the Arkansas Paranormal and Anomalous Studies Team, a member of the T.A.P.S. group and "one of the nation's largest and most active paranormal research organizations"), they acknowledge that ghost hunters still don't know what ghosts are. Flaxman and Jones briefly describe about a half dozen theories about what ghosts might be. The most popular idea is that ghosts are the earthbound spirits of the deceased. They admit that "this theory creates more questions than it answers" but nonetheless note that it is "the gold standard that guides most ghost hunters and paranormal researchers." But there are of course other theories, including:

1) Ghosts are "created by naturally occurring environmental conditions such as electricity and electromagnetic radiation"; evidence for this often comes in the form of EMF readings.

2) Ghosts are the "'playback' of energy or stored human emotion that was once present in the location and then somehow captured or 'recorded' into the environment"; evidence of this theory is often discussed in terms of "residual hauntings," for example. Flaxman and Jones noted that if this theory is correct, it raises questions about the legitimacy of EVPs (ghost voices), which may in fact be "merely the thoughts and feelings of the investigators."

3) Ghosts "are very much alive and active, but present in alternate dimensions or realities." Flaxman and Jones speculate that "if a ghostly apparition is indeed coming to us from another dimension or parallel universe, it might not be a dead person at all but a real, live person whom we are merely glimpsing across the great divide of reality."

4) Ghosts may be either figments of our imaginations or products of temporary hallucinations (created, for example, by brain chemicals or low-level electromagnetic fields).

5) Ghosts "are sentient entities that enjoy vexing and even harming humans." This theory suggests that ghosts are similar to supposed demonic entities or fairies.

In the end, Flaxman and Jones acknowledge that "the bottom line is ... even when we appear to have some kind of direct communication from a ghost, we cannot know for sure that we are dealing with a spirit of the dead" (p. 41). This refreshingly candid admission is exactly correct, and it fatally undermines virtually all of the other ghost hunters and paranormal researchers in the book and around the world. The fact that neither Flaxman and Jones—nor anyone else, for that matter—can conclusively rule out any of these competing explanations for ghosts demonstrates clearly that there are no proven facts about ghosts, no certain knowledge; it's all guesswork, speculation, and opinion often presented as self-evident truth ("our team helped the ghost to move on") or established fact ("through EVPs the spirit told us he was angry").

Those who might suggest that each of the different theories Flaxman and Jones present as plausible candidates for ghosts may simply be different aspects of the same phenomenon should be aware that many of the explanations are in fact mutually exclusive. For example, a ghost cannot be both a sentient earthbound spirit *and* a hallucination; nor can a ghost be some sort of "stored environmental emotion" unknown to science *and* a malevolent, mischievous spirit or live human from another dimension. These theories must be entirely different phenomena with different mechanisms. An apt analogy might be a sommelier speculating about what ingredients may have been used to create a specific table wine, but the candidates are not different varieties of grapes but instead a tree, an airplane, a football, and a dolphin. If ghost experts don't have

enough known, independently verifiable information about what they're studying to distinguish between a hallucination, a "time slip" from another reality, or a sentient spirit of the dead with verifiable knowledge of the past, the field is in far worse shape than anyone dared imagine.

Descriptive Ghost Categories

Instead of (or in addition to) offering discrete categories of ghost epistemology, many writers categorize ghosts by their apparent intent or purpose; through this prism the ghost's behavior determines what "type" it is.

Any speculation about a potential ghost's motivations, however, is a frivolous and pointless task because there's no way to independently confirm it. No matter what "answer" a ghost hunter comes up with as to why whatever phenomenon he or she perceives as something a ghost "does" (appears at a certain location, makes a specific sound, etc.), another ghost hunter might come to a completely different—yet equally valid—conclusion based on the same logic and "evidence." Does a ghost haunt a room because she died there in 1830 or because she saw her child die from a specific window in that room or just because she likes the wallpaper? Who knows? There's no verifiable, provable right or wrong answer as to why a ghost does anything, and therefore as an investigative technique it's a dead end.

Even if a ghost exists, and even if it can (and chooses to) communicate its motivations to a ghost hunter, and even if the ghost hunter correctly guesses the ghost's intent based upon taps or knocks or some other inherently ambiguous method, that doesn't solve any mystery; a ghost hunter concluding, "I believe this ghost wanders the hallway mourning his dead wife," even if completely true, doesn't explain anything or give any information upon which to further our knowledge of ghosts. It's a waste of time and effort. Determining *why* a ghost seems to do something is no more useful than asking it what its favorite color is; there is no independently verifiable right or wrong answer.

Another way to examine these various efforts at ghost categorization—however well intentioned—is its fruitfulness: Has it helped us understand ghosts or apparitions? So far the answer seems to be a clear no. Just as spending time deciding why an apparition has chosen to manifest itself is pointless, there's no point in spending time trying to figure out what type of spirit is in a place. Is it Type A, B, C, or D? The answer, of course, is that it doesn't matter; it's not like a mechanical problem in which a person must first assess the situation to determine what tool to use for the specific job (wrench, screwdriver, pliers, hammer, etc.). No credible ghost investigator ever said, "Well, I was baffled by this paranormal haunting for weeks until I realized I'd made a silly mistake: I re-read a ghost hunting book and found out I wasn't dealing with a residual haunting entity; it was really a *poltergeist*! I felt pretty silly, but once I figured that out I solved the mystery and proved the ghost existed."

The important thing is determining whether a given apparently mysterious phenomenon (of whatever sort or category) has a mundane explanation. Guessing at—or claiming to know—why a ghost did something or what kind of spirit it might be is like trying to determine what musical note a sound is before proving or verifying that any sound exists or trying to figure out what color a light is when it's not clear a light is even present.

This fundamental inability to decide anything about even the basic nature of ghosts is especially surprising given the fact that ghost hunting is the world's most popular paranormal pursuit. Inspired by reality television shows such as *Ghost Hunters* and its ilk, tens of thousands of people around the world have taken up ghost hunting. Never before in human history has so much time, money, technology, and effort been devoted to the ostensible goal of understanding the spirit world—resulting in not a single verifiable conclusion.

If ghosts do exist and could be any or all of these different entities and therefore anything goes, then why bother to have the categories at all? If a ghost can truly be anything you imagine it to be, and have any characteristics you can imagine it to have, how is that different from an imagined ghost? Unless the definitions and explanations for ghosts are anchored in verifiable reality and empirical evidence, it's all speculation and guesswork. When and if ghosts are proven to exist—and their differing properties can be scientifically quantified and categorized—it will be useful and important to distinguish between types of spirits and apparitions. Until then it's merely a parlor game distracting amateur ghost hunters from the task at hand.

Determining *why* a ghost seems to do something is no more useful than asking it what its favorite color is; there is no independently verifiable right or wrong answer.

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Sorry, 'Theistic Science' Is Not Science

A critical examination of the book *Who Was Adam?* demonstrates that creationism is not science.

BRIAN BOLTON

A recently published book documents the creationist misrepresentation of science called "theistic science." *Who Was Adam? A Creation Model Approach to the Origin of Humanity* (2015) consists of a reprint of a book of the same title published more than ten years earlier, followed by a thorough update that constitutes one-third of the text.

The authors are Fazale Rana and Hugh Ross, both executives and scholars with Reasons to Believe (RTB), a Christian ministry located in Southern California. They have graduate degrees in science (chemistry and astronomy, respectively) and have written many books that profess to put biblical creationism on a scientific foundation.

Rana and Ross's work focuses on the "scientific case for God's existence and the Bible's reliability" and the "integration of scientific fact with biblical faith." Throughout *Who Was Adam?* they describe their creationist approach to human origins as science.

However, Rana and Ross also make clear their fundamental biblical premise: "We believe life's origin and history cannot be fully explained apart from the direct involvement of the Creator, who repeatedly intervened in Earth's history, initiating new life-forms, including humans who alone were made in His image."

This premise reflects Rana and Ross's explicit statement that creation by supernatural intervention is the foundational assumption of RTB's human origins model. The central presupposition of "theistic science" is operationalized in the repeated use of phrases such as "God's handiwork," "Creator's direct action," "work of the Creator," "God's creative work," and other causal behavior attributed to the biblical deity.

The RTB strategy does not satisfy the basic requirements of a scientific endeavor, and in this article I explain why, giving numerous examples taken primarily from the ten-year update of *Who Was Adam?*.

Creation Model

The RTB human origins model is based on all Bible verses that describe God's work in creating humans and that recount early human history. Six well-known assertions illustrate the RTB creation model's testable propositions:

- God created Adam and Eve as the first humans (the primordial couple) through direct intervention.
- All humans came from Adam and Eve, who are the parents of humanity.
- Humans originated in a single geographical location, the Garden of Eden.
- A universal (but regional) flood shaped early human history.
- Life spans of the first humans were once longer than 900 years but shortened after the flood.
- Humans are behaviorally distinct (in ways that reflect God's image) from the earlier hominids and the great apes.

The authors' stated objective is to demonstrate that a traditional biblical view of human origins has scientific credibility. They assert that the RTB model recasts the biblical scenario into scientific terms. It is purported to be like all scientific ideas or models, in that it is poised to stimulate future scientific work. With RTB's biblical model, Rana and Ross argue that the concept of creation is testable and has entered the scientific domain. Not surprisingly, they state that *Who Was Adam?* is primarily a scientific book.

Scientific Principles

Before listing concrete examples of Rana and Ross's approach to defending the RTB biblical view of human origins, I want to outline the major violations of scientific logic embodied in their work:

- The RTB creationist propositions are immune from refutation or falsification, because the Genesis account is held to be literally true. The premise of verbal inspiration or inerrancy of scripture contravenes the basic assumption of scientific hypothesis testing, which requires that negative evidence result in rejection of the tentative propositions that are formulated.
- The RTB model is based on the alleged reality of supernatural causation, which is the core

assumption of "theistic science." Rana and Ross continually invoke God's motives and actions in explaining scientific research findings or dismissing evidence that contradicts their creationist claims.

• One of the hallmarks of the scientific approach to knowledge discovery is objectivity. This means that independent evaluations of evidence are essential in making judgments about scientific claims. Yet Rana and Ross by themselves generate all conclusions about the validity of the RTB model, even when their opinions are flatly contradicted by the scientific consensus.

• Rana and Ross repeatedly engage in circular reasoning in defending the RTB human origins model against unsupportive or contradictory findings. Specifically, they regularly invoke ad hoc theological explanations, including common design (rather than common descent), the Noachian Deluge, and the mysterious life attribute of "soulishness."

• The false equivalence of biblical creationism and human evolution as scientific explanations is routinely advanced by Rana and Ross. This comparison is unwarranted because the former is faith-based while the latter is evidence-based. One is accepted by believers as God's truth while the other is subject to ongoing revision on the basis of abundant empirical data.

In what appears to be an inconsistency with their scriptural inerrancy assumption, Rana and Ross state that the RTB model represents only one of many possible biblically derived models for humanity's origins. They explain that considerable freedom exists within the RTB creation framework for adjustments, fine-tuning, revisions, refinements, and extensions. Of course, the authors' concession gives the biblical creationists a lot of flexibility or "wiggle room" in integrating scientific findings into the RTB model.

The basis for this flexibility is the authors' declaration that the Bible must be "properly interpreted and understood"—but who decides what constitutes proper interpretation? They do! For example, the authors accept the "day-age interpretation" of the first chapter of Genesis, which considers creation "days" to be long periods of time. Thus, they are able to embrace the true ages of the universe and planet Earth, while excoriating the young-Earth creationists as not scientifically credible.

Throughout *Who Was Adam?* Rana and Ross describe their creationist approach to human origins as science.

Unscientific Reasoning

The following twenty arguments, interpretations, and conclusions exemplify problems with Rana and Ross's scientific reasoning.

• "Unfortunately, the latest results show no direct evidence for the flood; however, this does not mean there is no evidence for the flood."

• "We argue that modern humans occupied these sites after the flood and align closely with the timing and location of humanity's creation."

• "The popular interpretation of these salient discoveries challenges RTB's prediction, but these interpretations are controversial and reasonable alternative explanations exist."

• "At least on the surface this insight appears to support the evolutionary framework. However, the results readily fit within the scope of the RTB creation model."

• "This finding could be viewed from a biblical vantage point; for example, birds and mammals are 'soulish' creatures created with the capacity for emotion."

• "We would argue that God endowed some animals with soulishness and that chimp response to death reflects their soulishness, not a deep evolutionary connection to humans."

• "The high degree of human-ape genetic similarity is not problematic for RTB's model; we view the similarity as reflecting shared designs, rather than shared descent."

• "Pseudogenes can legitimately be viewed as the work of the Creator who intentionally introduced these features into genomes for a specific purpose."

• "Despite the scientific community's near-consensus, we maintain that our interpretation—that humanity originated from a primordial pair—has scientific legitimacy."

• "Given the seriousness of this challenge to our model, we are unwilling to accept the results; we contend that the population sizes generated by these methods are merely estimates, not hard and fast values."

• "We are not willing to abandon our conviction that mitochondrial Eve and Y-chromosomal Adam correspond to the biblical Adam and Eve."

• "Human origination from a small population is still consistent with the existence of historical Adam and Eve; it could be that the population-size estimates pertain to sometime after Adam and Eve's creation."

• "These results provide a crude (at best) guess and do not necessarily mean that humanity arose from multiple populations residing in different locales; it could merely be an artifact of experi-

mental design."
• "These events could be taken as evidence for the Creator's role in designing the fusion. Perhaps God used a preexisting template to create hominids and human beings. Could not God be thought of as a divine genetic engineer?"
• "Our graph presents a simplistic view of the natural history of hominid brain size, but one that allows what we believe to be a real trend in the data to be readily pictured."
• "The substantial discrepancy between humanity's origin and the emergence of agriculture could be explained by the first humans engaging in small-scale, mixed farming at levels that escape scientific detection."

• "Even though most scientists interpret the genetic similarities between humans, Neanderthals, and apes as compelling evidence of common descent, we interpret these data as reflections of common design."

In each of these twenty examples, Rana and Ross argue against the majority scientific interpretation, or they simply reject the overwhelming scientific consensus. To buttress their contrary opinions, they always provide some kind of rationale, of which there are three types.

First, there are standard ad hoc theological explanations that have no basis in science, such as: *after the flood*, *soulishness*, *work of the Creator*, *prior to Noah's flood*, *God's handiwork*, *divine genetic engineer*, and *common design*. Second, there

The authors' stated objective is to demonstrate that a traditional biblical view of human origins has scientific credibility.

• "We concede that these new insights do not rescue the RTB model completely from the challenges stemming from the Neolithic Revolution, but they do make it much more likely that early humans engaged in some form of proto-agricultural practices."
• "There are no 900-year-old human fossils because humans aged more slowly prior to Noah's flood, long biblical life spans may only apply to a few people, and murder was rampant in the era before the flood."
• "God created microbes for a variety of reasons, but He did not create corresponding human pathogens when He made humans; however, God did create beneficial microbes as part of His good creation."

are vague criticisms, including: *artifact of experimental design*, *escape scientific detection*, and *aged more slowly*. Third, there are non-specific objections like: *controversial*, *mere estimates*, and *crude guesses*.

Because they invoke common design so often in *Who Was Adam?*, Rana and Ross argue that godly design is actually a respectable scientific concept. To accomplish this remarkable transformation from theology to science, they reached back in history to a pre-Darwin British biologist named Sir Richard Owen, who promoted a theistic explanation (One Cause, the Creator) that Rana and Ross refer to as an "alternate scientifically robust model that makes sense of biology." Thus, RTB's biblical creation model employs this "scientific precedent to interpret shared features as a reflection of God's intent by repurposing common designs."

Rana and Ross's preeminent violation of scientific logic deserves special attention due to its ubiquitous presence in their book. This is the use of circular reasoning, which entails invoking theological concepts to defend the RTB theistic model against nonsupportive or contradictory scientific findings. The bottom line for this logical fallacy: theological beliefs cannot legitimately explain away scientific evidence for the purpose of vindicating theistic propositions.

Evolution Criticism

Rana and Ross just can't seem to resist the impulse to attack human evolution, apparently believing that their criticisms strengthen the case for the Genesis creation narrative. In fact, the alleged difficulties with evolution, even if true, would not constitute evidence *in favor of* creationism. Here are six of their criticisms of evolution:

• "That human evolution occurred is as much a hypothesis as how it occurred."
• "This demonstrates just how tentative and speculative the central tenets of human evolution are."
• "It is eye-opening to realize how much uncertainty and speculation is associated with human evolution scenarios."
• "It is impossible to interpret the fossil record from an evolutionary perspective."
• "Evolutionary biologists' insistence that humanity emanated from a population (not two individuals) results in a theory-laden conclusion."
• "Confusion associated with the interpretation of hominid fossils from an evolutionary view supports RTB's biblical creation view."

Contrast these severely critical remarks questioning the validity of human evolution with the circular ad hoc theological explanations, endless excuse-making, and outright denial of scientific consensus that Rana and Ross use to defend their RTB human origins model. The last assertion above is especially noteworthy for illustrating the logical fallacy of arguing from ignorance.

Overall Evaluation

Rana and Ross claim that science affirms the RTB human origins model in ten areas of research, for which they apply the following descriptors: "effectively accounted for," "new insights support," "in line with (but presents a problem)," "in accord with," "readily accommodates," "makes sense of," "expand the model," "a tour de force," "a fulfilled prediction," and "a reflection of God's intent by repurposing common designs." It is important to recognize that failure to contradict a claim does not constitute strong support for the claim. Only two of the ten descriptors are clearly affirmations, and the last is just one more ad hoc theological explanation.

The authors next identify five areas where science has challenged the RTB model. First, they admit they were wrong about the dates for Adam and Eve but say their corrected dates still harmonize with scripture and, after re-interpreting two Genesis chapters, they conclude that Adam and Eve were created during the most recent ice age!

Contradicting Rana and Ross's prior position that modern humans and Neanderthals did not interbreed, strong evidence now shows that they did interbreed. However, the authors argue that from a Christian perspective, humans and Neanderthals are distinct products of God's creative activity and therefore this does not invalidate the RTB model because the ability to interbreed is a manifestation of shared design, not common descent.

Rana and Ross characterize human-Neanderthal interbreeding as morally repugnant, sordid, salacious, sinful, distasteful, degenerate, and comparable to bestiality. Then they excuse this condemnable miscegenation by explaining that the Bible and history testify to humanity's depraved nature after the Fall. They declare that it should not be surprising that humans interbred with Neanderthals, given the human propensity for intercourse with animals! Even after this admission, Rana and Ross assure us that RTB's model can accommodate evidence for such degenerate behavior.

A key feature of the RTB model centers on the idea that humans are uniquely created in God's image. Rana and Ross admit that the very large discrepancy of up to 100,000 years between the first appearance of humans and the emergence of symbolic capacity (reflecting God's image) is a potential problem and, after offering a partial explanation, they acknowledge some residual discomfort.

The basis for this flexibility is the authors' declaration that the Bible must be "properly interpreted and understood"—but who decides what constitutes proper interpretation? They do!

The authors concede that one of the most significant challenges leveled against RTB's creation model relates to humanity's original population size. Was it several thousand people or just two individuals? They currently believe—even though almost all geneticists disagree—that the RTB model can withstand this challenge.

After their detailed review of a variety of research studies that address the propositions of the RTB human origins model, the book concludes by stating that "we trust that Adam's identity has been established as an image-bearer of his divine Creator." Thus, they achieve a theological conclusion that is independent of the scientific evidence. Not surprisingly, the conclusion follows directly from their faith-based premise that I summarized in the introductory section of this article.

Rana and Ross have produced creative and sometimes incredible arguments to provide people of faith with "reasons to believe" the alleged truth of the Bible's creation narrative. For the reasons given in this article, I do not think they accomplished their goal within the parameters of science. Can the biblical creation chronicle be reconciled with factual scientific knowledge? *Who Was Adam?* demonstrates that the answer is no. In other words, "theistic science" is not authentic science. Instead it constitutes a strategy for sustaining biblical faith.

Finally, I want to express my admiration for the tremendous energy and commitment that Fazale Rana and Hugh Ross demonstrate for their work. They carefully reviewed seventy pages of references consisting mostly of mainstream scientific publications and attempted to integrate the findings into their biblical creation model. There is no doubt in my mind that they are sincere, honest, knowledgeable investigators. I think their efforts are misguided, but my critical comments should not in any way be construed as questioning their integrity. From the perspective of science, they are simply wrong.

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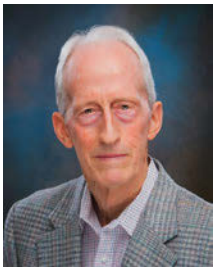

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The 1849 Balvullich Ice Fall

A mass of solid ice weighing nearly a ton fell on a Scottish farm on the estate at Ord during a thunderstorm on July 30, 1849. Theories abound as to its origin, some more fanciful than others. New analysis suggests that the ice originated locally and did not fall from the sky, as has long been thought.

RANDALL J. OSCZEVSKI

Large chunks of ice seem to have been falling from the sky for centuries. The star of these reports is a solid mass of ice weighing nearly a ton that fell during a thunderstorm on July 30, 1849, near Balvullich (or Balavulich), a farm about ten miles west of Inverness, Scotland. The *Guinness Book of World Records* (2016) called it the "Largest Piece of Fallen Ice" and suggested that it was composed of hailstones fused together by lightning.

The initial newspaper report of the fall was edited and reprinted widely in British newspapers. It even found its way into *Scientific American*, where, decades later, it was noticed by Charles Fort, the archivist of the unexplained. Fort (1972, 217) called it "one of our best expressions of external origins" and hinted that it had dropped from some hidden land in the sky. Another eccentric theorist couldn't decide whether it had fallen from an alien spacecraft or if it had been blasted into orbit when the lost continent of Mu was destroyed by an ancient nuclear war (Jessup 2003). At the other end of the spectrum, Arthur C. Clarke (1980) noted that the thunderous booms that heralded the fall "were like the sonic booms of our re-entering spacecraft" and wondered if it might have been a piece of a comet.

These days, when lumps of ice break car windshields or punch holes though the roofs of houses, some experts think of oversized hail (Martinez-Frias et al. 2005) while others suspect aircraft toilet leaks or wing icing (Davidson 2006). The ice fall at Balvullich is particularly intriguing because there were no modern aircraft in 1849 (Clarke 1980).

Contemporary reports of the event, including weather reports, which are available from britishnewspaperarchives.co.uk, modern science and Ordnance Survey maps can tell us much about this singular event.

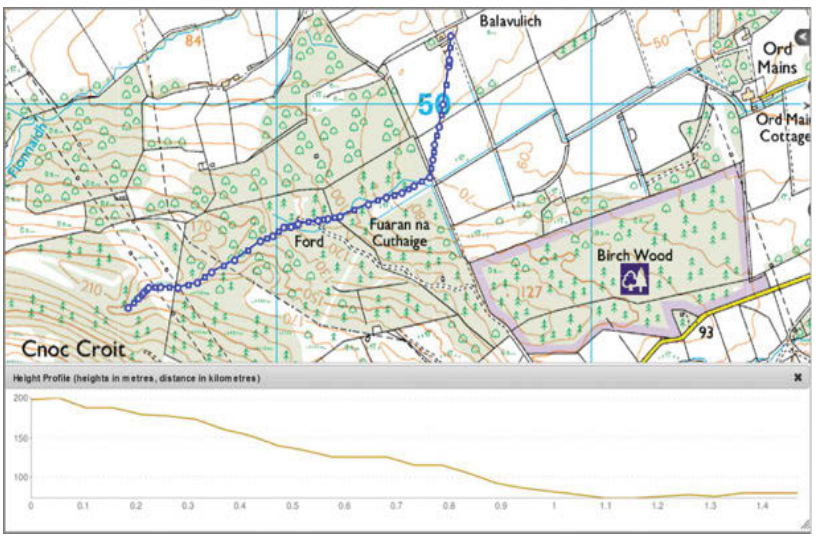

Figure 1. Balvullich. Copyright 2016 Getmapping.plc. Photo by Digital Globe, May 2009.

The First Report

A witness to the ice fall wrote to his local newspaper. In those days correspondents' names were not revealed; let's call him John. His letter reads, in part:

> Immediately after one of the loudest peals of thunder we ever heard, a large and irregular shaped mass of ice reckoned to be nearly twenty feet in circumference, and of a proportionate thickness, fell near the farm-house. It had a beautiful crystalline appearance, being nearly all quite transparent, if we except a small portion of it which consisted of hailstones of uncommon size fixed together. It was principally composed of small squares—diamond shaped—of from one to three inches in size, all firmly congealed together. (*Ross-shire Advertiser* 1849)

John was evidently at the farm when the ice fell, for he used the pronoun "we" when describing the thunder that heralded its arrival. The writer might have been John Moffat Sr., who rented Balvullich from Thomas Mackenzie, the eighth Laird of the estate at Ord. John Moffat Sr. was a middle-class farmer, a tacksman on the Ord estate, a respected member of the community, and a leader in his church (*Inverness Courier* 1855). In 1849, John and his wife, Janet, were both forty-eight years old. Five of their seven children between the ages of ten and twenty-five were still living with them in the croft house during the 1851 census. It was an unusual double-length croft house having a second apartment where five tenants or employees lived in

1851. It still stands, next to the original barn (Figure 1). An 1872 map shows it connected to the barn, which opened on its east side.

A Huge Hailstone

In September, the *Inverness Courier* published two letters on the Balvullich ice fall under the title "A Huge Hailstone" (*Inverness Courier* 1849a; see Figure 2). The editor retold most of the story of the first letter in his own words. The few lines that were quoted indicate that the correspondent was educated and literate in both English and French, if not actually scholarly. He might have been Thomas Mackenzie, who would likely have taken an interest in a "crash site" on his land. Let's call him Thomas.

John reported that the ice had fallen "near the farm-house," but Thomas appears to have followed its track uphill until he found where it had hit the upper field. Inconsistencies suggest that the editor might have confused the order of events when he restated Thomas's letter.

ORIGINAL COMMUNICATIONS.

A HUGE HAILSTONE.

On the night of Monday, the 30th of July last, during a heavy rain, which was accompanied by loud peals of thunder, a hailstone or piece of ice of gigantic proportions fell on an elevated part of the farm of Balvullich, on the estate of Ord. It was composed apparently of hailstones, consolidated into one hard mass of seven feet in breadth. The stones were of the size of peas, and the whole mass was of a form between round and oval. A correspondent who furnishes us with these particulars states that the mass had a saltish taste. It fell into a *gully* at the mouth of a barn, and it seems to have first struck slantingly a stone-dyke, from which several stones were displaced, and then to have dashed violently down the side of the *gully*, on which its course was clearly marked, until it finally rested in a hole at the mouth of the barn. It melted considerably the day after it fell, and very soon afterwards disappeared. The writer adds—"This is the largest hailstone I ever heard of. Mezeray, in his History of France, mentions one of the weight of 100 pounds that fell during a terrific thunder-storm in the year 1510, and this is the largest I observe recorded; but the one which fell at Ord could not have weighed less than 12 or 15 cwt." We can only oppose the preceding statements (on what we think is good authority) to the following scientific opinion which has been addressed to us :—

Figure 2. *Inverness Courier*, September 13, 1849. Copyright The British Library and The British Newspaper Archive.

At first, he says that the ice fell "on an elevated part of the farm," probably in the upper field. After describing the ice mass, he states that it fell into "a gully" at the mouth of a barn; later he changes this to "a hole." He notes that the ice hit a stone wall that it had dashed violently down a gully. If Thomas's original letter had described the track of the ice as it was discovered by backtracking it across the fields, the ice might have gouged its way down the gully before it glanced off the stone wall, not afterward. It makes no sense to have a gully across a level field or leading to the barn.

There is no such gully today, and probably, there never was, for it would have ensured that the farmstead flooded every time it rained heavily. However, there is a natural drainage channel or swale above the farm that might be the "gully" in question. Deep natural ravines running down the sides of Scottish mountains were sometimes called gullies. The gully on the elevated land above Balvullich was much smaller, which might explain the editor's use of italics.

Someone Left the Cake Out in the Rain

Thomas's account was followed by comments from someone using the pen name "Peat Reek" (i.e., peat smoke), whom the editor considered qualified to provide a scientific opinion. Reek had read John's letter but not Thomas's. His blustery rant seems to have been printed as received.

Mr. Reek dismissed John's statement as "not only exaggerated but wholly unworthy of belief" (Reek 1849). His chief objection, a good one in my opinion, was that it was "preposterous" to believe that a piece of brittle ice weighing nearly a ton could fall from a height of over a mile in the sky (above the freezing level) and hit the ground without being "dashed to pieces."

Reek noted that even "common observers" knew that August was a prime month for meteoric phenomena and slyly added that if Mr. Moffat had examined the ice more closely he would have seen that it was actually "a gigantic wedding cake studded with bon-bons and sugar plums!" (Reek 1849). He clearly thought it a hoax.

Did It Fall from Space?

Whether ice can survive a plunge from space to reach the ground has recently become a matter of some interest. Mathematical models of the fiery flight of meteors (Beech 2006; Baldwin and Sheafer 1971) indicate that even very large chunks of ice hitting the atmosphere have little more chance of reaching the ground than the proverbial snowball. Beech (2006) concluded that "just maybe" an ice-meteoroid of a few pounds might reach the ground. When extrapolated, his chart of initial and final mass comparisons suggests that if the ice at Balvullich had fallen from space it must have started out as a cometary fragment weighing about 80 million pounds. That is four times the mass of the Tunguska object, which created a huge fireball and blast wave that scorched and flattened 800 square miles of Siberian forest in 1908. No forests were flattened in Scotland in 1849, and no fireball or blast wave was reported, just a sound like thunder.

The date of the fall coincides with the peak of the recently discovered annual α-Capricornis meteor shower (Lundsford 2009). The parent body of this shower is a comet that partially broke up millennia ago. However, as even the largest fragment of comet ice would have evaporated after just a decade or two (Beech 2006), there would have been no ice left to fall on Balvullich in 1849—just dust.

Atmospheric Ice or Ground Water?

Thomas's letter says that the ice was composed "apparently" of hailstones the size of peas, which is clearly a guess (either by Thomas or the editor). John, who had actually seen the ice, reported that it was crystalline and transparent and was easily distinguishable from the hail that composed a small part of it. Hailstones are white because they contain tiny bubbles that reflect light. Ice that freezes slowly, as in a lake or pond, can often be crystal clear. Thomas noted that the ice tasted "saltish." Atmospheric ice shouldn't taste salty because it is pure water vapor that has condensed in the air; however, ground water might.

If Reek had seen a topographical map of the area, he might have been less dismissive of John's story, but there were no such maps until 1856. Modern maps show a round bald hill behind Balvullich called Cnoc Croit na Maoile. The elevated part of the farm, where the track of the ice seemed to start, is on the lower slope of this hill. It is now covered by a mature forest (Wilson 2015). There is a spring on the hillside about 150 feet higher than the farm house. Close to the spring is an ancient ruined farm house

(Historic Environment Scotland 2018) where a small dam and pond for watering livestock might once have existed. The wide bench 425 feet above the farm is boggy in spots and might once have held a pond or spring.

As Sherlock Holmes might put it, having eliminated the impossible, we must concentrate on whatever is left. If it didn't fall from the sky and it tasted salty, we can assume that the ice had a terrestrial origin, however improbable that might seem in midsummer. There are two hurdles to overcome in a terrestrial hypothesis: how the ice failed to melt before August and how it got to the farmstead of Balvullich if it didn't freeze there.

The Long Winter of 1849

The winter of 1849 was one of the last of the Little Ice Age. After a false spring in February, it returned with a vengeance more than once. Deep snow fell at the end of that month and again in March (*Stirling Observer* 1849a). In April, a storm brought a "hurricane of snow and drift such as has not been experienced in this quarter at the same season for very many years" (*Inverness Courier* 1849b).

The first half of June was said to be the coldest in living memory. One Scottish newspaper compared those first two weeks to December; another to January (*Elgin and Morayshire Courier* 1849). Ice on pools was "as thick as a shilling" on June 11 (*Stirling Observer* 1849b) and snow was reported in Banffshire and on the Grampian Hills in the second week of June with damaging frosts (*Elgin and Morayshire Courier* 1849). Snow fell at Manchester, England, on June 14, where hoar frost was reported on hedges (*Perthshire Advertiser* 1849). July was described as fine, genial, and even excellent for crops, with daytime temperatures sometimes rising into the seventies but lacking the heat of a normal summer.

Many Victorians managed to keep ice through the summer in ice houses by covering it with vegetation or saw dust. Dry peat is a surprisingly good insulator (Ballantyne 2018). Given the unusually cold weather that year, buried ice in a shaded swale on the northeast side of a hill might have lasted through July.

Revelations

We are left with the puzzle of how the ice could have traveled more than half a mile down a moderate slope and then ploughed across a level field to the barn if it didn't have a high velocity from a sky fall. The answer might lie in its shape.

Thomas said the ice was seven feet in diameter and estimated its mass at "12 to 15 cwt." A hundred weight (cwt) is 112 pounds, so he estimated it weighed between 1,330 and 1,670 pounds. Clearly it wasn't a sphere, as one might imagine a giant hailstone to be, because a seven-foot-diameter sphere of ice would have weighed more than 10,000 pounds. Using Thomas's upper limit of 1,670 pounds and a density of 57 pounds per cubic foot, we can calculate its volume at 29 cubic feet. A disk

Figure 3. A typical millstone. Photo used with the permission of Steve Schimmrich. From his *Hudson Valley Geologist* blog.

that is seven feet in diameter need only be nine inches thick to weigh 1,670 lbs; eleven inches if its diameter is 6.4 feet (i.e., $20/\pi$). Perhaps it was a disk.

John, an eyewitness, said it was "irregular," but his use of the word *circumference* suggests roundness. He didn't estimate its weight but noted that after it had melted for a day it took "two stout grown up lads to overturn it." They didn't roll it; they *overturned* it, which seems to confirm that it was more flat than spherical. John added that it had "a proportionate thickness," but what does that mean? Clearly, John had some familiar object in mind—one that had similar proportions but a different circumference. He didn't say what that was, but I can guess. I imagine that when he first saw it, illuminated by a flash of lightning in a fog-filled hollow by his barn, a man like John Moffat Sr. might have been reminded of Revelations 18:21: "And a mighty angel picked up a stone like a great millstone and cast it into the sea."

The old millstone in Figure 3 is typical for New York's Hudson Valley (Schimmrich 2014). It has a diameter to thickness ratio of 6.6. If it had a circumference of twenty feet, it'd be 11.6 inches thick; 12.7 inches if it were seven feet in diameter. These proportions are in the same ballpark as those calculated for the object that John and Thomas described. It appears that the "Huge Hailstone" that fell at Balvullich was shaped something like a millstone. This new information undermines any suggestion that the report was a hoax, for who would have imagined a giant hailstone or ice meteorite as a wheel of ice?

I had a revelation of my own after watching slabs of ice slide off the roof of my house one spring day. I'd noticed some narrow, dashed trails in the crusted snow that covered the lower roof and wondered how they'd been created. I watched a few slabs slide down the snow-covered shingles on the more steeply pitched roof above, but none made it past a zone of bare shingles above the eaves. One began to rotate as it slid. It stopped for an instant when it hit the bare shingles, but its momentum made it flip up onto its leading edge, and its rotation made it pirouette around the point of contact. It then began to roll on its rim across bare shingles, right off the upper roof.

Still spinning, it dropped about ten feet onto the lower roof and then bounced and wheeled down it, leaving a dashed trail in the icy snow. Sometime later, it dawned on me that the disk-shaped ice mass that had "dashed" down a gully at Balvullich might have had gone as far as it did because it was rolling on its rim. Rounded natural objects often get their shape by rolling, and once they get going, the heavier they are the farther they roll (Bejan 2016).

How Ice Might Have 'Fallen' on Balvullich in Summer

During the temporary warm spell in February, a frozen pond in a drainage channel on or near a wide bench partway up Cnoc Croit na Maoli was buried by an avalanche of heavy snow, peaty soil, and vegetation from the steep

upper slope (Figure 4). Like ice in an icehouse, the insulating vegetation kept the pond frozen through the coldest, snowiest spring in living memory, until the end of July—cold enough that wet hail froze to it during a hailstorm.

The heavy thunderstorm at the end of July produced a powerful flood that washed away the insulating cover, dislodged a large piece of the pond's thick covering of ice, and washed it down the slope, rotating in the flood. At some point, it grounded, tipped up on edge, and started rolling downhill on its rim. It wheeled and bounced down the hill, accelerating until it reached the bottom of the slope, losing corners as it went.

A sound like thunder shook the Moffat family home as the unbalanced wheel of ice roared down the hillside. The stone wall at the foot of the upper field both deflected and slowed it. It lost more speed as it thundered across the level field, throwing up a spray of mud and water. Fortunately, it missed the house and wobbled into a hollow on the open side of the barn, fell on its side with a thump, and ground to a halt.

Figure 4. One possible rolling path begins on the bench about 425 ft. above the farm house and continues down a small gully. The upper field of Balvullich extended to about the 100m contour at the time. From WalkHighlands.co.uk (route planning). Contains Ordnance Survey data ©Crown copyright and data base right (2011).

Conclusion

This scenario seems to fit the contemporary reports, the topography, and the weather in 1849. It can be tested and used to make predictions, which takes it two steps closer to being science than any previous solution. No hypothesis is useful or scientific if there is no test that might disprove it. Mathematical modeling might answer some questions, but the issue of whether a three-quarter-ton wheel of ice can actually roll 1,200 yards down a 12 percent grade and then runout almost 400 more on level ground might require a full-scale experiment.

The ice-wheel model of the 1849 "fall" predicts that unless it was precipitated by some unique factor, such as the breaking of a small dam that had created the pond, it could happen again. However, it is unlikely to, as long as the forest that grows on the lower slopes of Cnoc Croit na Maoile stands. Before this forest is harvested though, it might be wise to ensure that water cannot pond on the lower slopes of the big hill behind Balvullich.

Acknowledgements

I thank Shawn Jason, a Fortean researcher specializing in ice fall reports and the founder of Megacryometeors.org, for sharing the original newspaper report of the fall and for bringing Arthur C. Clarke's musings to my attention.

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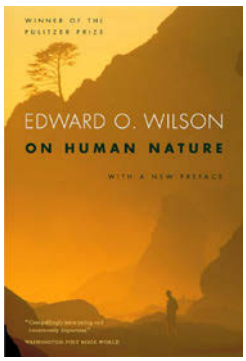
The Fortieth Anniversary of E.O. Wilson's *On Human Nature*

PAUL BROWN

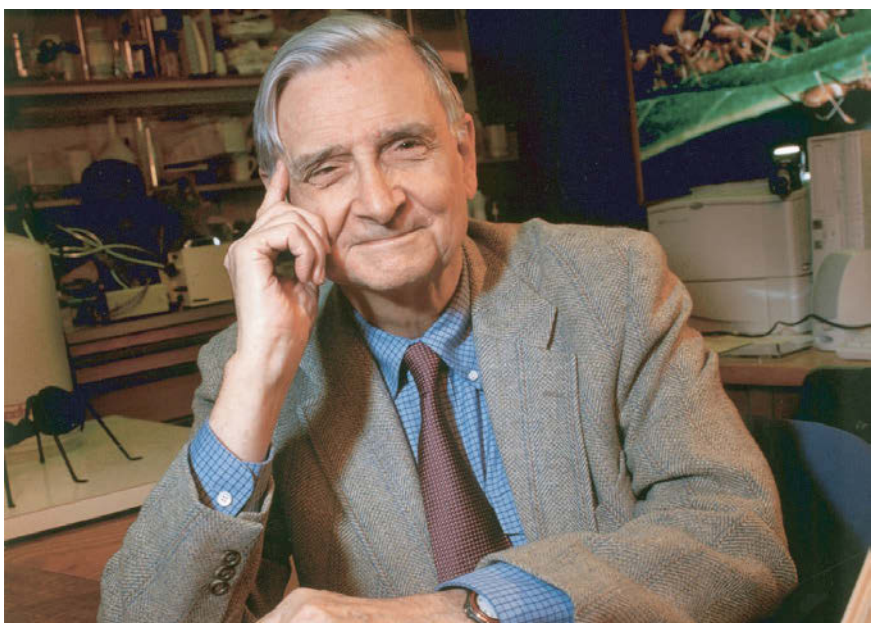
This year marks the fortieth anniversary of the publication of E.O. Wilson's book *On Human Nature*. The book remains, even for modern readers of a skeptical or humanist mindset, a touchstone in the debate about whether human nature is innate, and therefore universal, or imprinted, and therefore cultural and necessarily local in space and time. Spoiler alert! *On Human Nature* argues that it's both. But along the way the book assembles compelling scientific evidence demonstrating the impact of evolutionary biology in at least constraining the many forms, often bizarre and sometimes not particularly beautiful, that human cultures take on.



On Human Nature: Revised Edition with New Preface. By E.O. Wilson. Cambridge, MA: Harvard University Press, 2004 (First Edition, 1978). ISBN 978-0674016385. 288 pp., Paperback, $24.18.

E.O. Wilson is one of the most storied scientists of the past hundred years. For starters, he's an absolute authority on ants and social insects. Ever wonder how a few scouts stealing crumbs convert so rapidly to serried ranks of organized warriors and workers ruining your sandwich break? He figured that out. Briefly, it's pheromones. Why do worker bees routinely kill themselves in defense of the hive? Because they share more genes with their sisters than they would with any offspring, making such altruism highly pro-adaptive—at least from their genes' point of view. From there, it was a short step to a study of

E.O. Wilson is one of the most storied scientists of the past hundred years.



collective and socially collaborative animals: invertebrate corals, social insects (ants, bees, wasps), certain birds, a majority of mammal species, and (if distinctions must be made) human beings. All of this culminated in Wilson's 1971 publication of *Sociobiology: The New Synthesis*.

That book made a lot of people really mad. Wilson, they charged, was arguing for a kind of biological determinism. Remember, this was the end of the 1960s. "We cannot be the monsters we appear to be—sexually hypocritical, colonialist warmongers and capitalists with gender-specific color preferences, inconsistent empathic responses, not to mention flared pants and discotheques—simply because that's what our genes dictate!," they demurred. This reaction was probably Wilson's fault. He devoted only a relatively brief section of *Sociobiology* to human beings. He felt obliged to return to the question of what evolutionary biology can teach us about ourselves in *On Human Nature*.

What, Wilson asks, counts as universally human? Strip away the ornamentation of any specific culture, mix and sift the residues, and what is left? In the book, Wilson tells us that human nature seems to be characterized (at least) by various taboos (often but not exclusively related to reproduction), language use, aggression, and patterns of sexual behavior, as well as distinctively human phenomena such as altruism and religious belief. Most of the book is a long-form examination of the evidence—from anthropology, psychology, and ethology—describing and explaining the biology underpinning these facets of human nature. Cultural objects, Wilson argues, are mind objects, manifold and diverse expressions of something universally human. The mind and the brain are intimates, which implies that human cultural possibilities must be at least constrained by our biology. And because the brain is biological, a good place to start thinking about the universals of human nature is the evolutionary path our species has taken. Voila! Human sociobiology.

The book is also notable for Wilson's novel take on the rancorous "is/ought" question. *Sociobiology* and *On Human Nature*—and indeed the entire notion that scientific inquiry into human nature can be useful—is frequently criticized on the grounds that while it might yield facts and models concerning what *is* the case, science can be no guide at all to answering moral questions about what *ought* to be the case. Fair enough,

The mind and the brain are intimates, which implies that human cultural possibilities must be at least constrained by our biology.

Wilson seems to acknowledge. But not all *oughts* are feasible; they sometimes clash with what *is*. To illustrate with an example not in his books, "Go forth and multiply" is a well-formed *ought*; it is one consistent with an observed *is* of biology. Yet nature holds all the cards. Scientific reason tells us that too much multiplication adds up to more individuals than the environment can sustain, leading to an abrupt and catastrophic subtraction—a clear division between *is* and *ought*.

What can we make of this? Wilson points out that human beings follow a mammalian plan of reproductive priorities: the individual first, the survival of close relatives second, and the endurance of the broader gene pool third. Such an *is* suggests an accommodating modification to the *ought*, a shift away from an individual mandate to something more collective. Indeed, many human societies recognize the peril of unconstrained individual reproduction. Not all *oughts* are created equal, and the insights of human sociobiology can help us reason about their trade-offs.

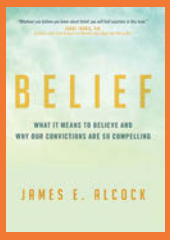
Sometimes, however, *is* and *ought* come into stark conflict. The crux of the problem is that given the apparent intractable nature of the *is* and the desirability of the *ought*, many people's reaction is to argue that the *is* isn't relevant. Wilson disagrees. He argues, instead, that we might need to modify the *is*: "Human emotional responses and the more general ethical practices based on them have been programmed to a substantial degree by natural selection over thousands of generations. ... Which of the censors and motivators should be obeyed and which ones might better be curtailed or sublimated?" Further, he suggests that we might even engineer the abandonment of certain aspects of our biologically constrained human nature to attain the desirable outcome of a well-reasoned *ought*. He goes so far as to say that doing so implies a program of "democratic eugenics."

Even forty years after publication (with one significant new edition in 2004), *On Human Nature* is still brimful with ideas and insights about who we are, how we got here, and how to get wherever we want to go. In fact, the theses of Wilson's writing on sociobiology were so challenging that they provoked others to write responses of similar quality. No reader of *On Human Nature* will have completed their journey without also reading Stephen J. Gould's *The Mismeasure of Man*. The latter book leavens and complicates the former, using lessons drawn from the history of science to re-entangle *is* and *ought*—beginning an ongoing conversation that continues to enrich us all. ■

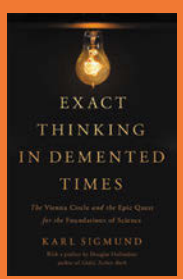
Paul Brown is a Silicon Valley computer scientist. He reviewed Andrea Wulf's *The Invention of Nature: Alexander Humboldt's New World* in our May/June 2016 issue and previously reviewed books by Daniel Dennett, Nate Silver, and Daniel Kahneman.

[NEW AND NOTABLE

Listing does not preclude future review.



BELIEF: What It Means to Believe and Why Our Convictions Are So Compelling. James E. Alcock. This book, by noted psychology professor (and CSI Executive Council member) James Alcock, explores the psychology of belief—how beliefs are formed, how they are influenced by both internal factors, such as perception, memory, reason, emotion, and prior beliefs, as well as external factors, such as experience, identification with a group, social pressure, and manipulation. The book is organized into five parts: The Power of Belief, The Belief Engine, Believing, Knowing Ourselves, Belief in a World Beyond, plus a final chapter "A Firewall to Folly." As Alcock says in his intro, "Our heads are chock-a-block with beliefs." They lead us to our great achievements. But faulty beliefs, arising from misapprehensions, misperceptions, misunderstandings, and misconceptions, "lead to inappropriate, maladaptive, and sometimes fatal actions." This is where virtually everything we examine in SI starts, and Alcock is a congenial and well-informed guide to our understanding. Prometheus Books, 2018, 638 pp., $28.



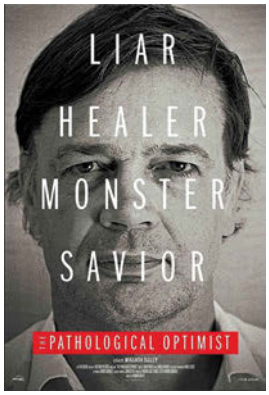
EXACT THINKING IN DEMENTED TIMES: The Vienna Circle and the Epic Quest for the Foundations of Science. Karl Sigmund with a preface by Douglas Hofstadter. While their world was in political disintegration after World War I, a group of Viennese thinkers came together to try to secure what seemed like the unsteady foundations of math, physics, and philosophy. Inspired by the insights of Einstein, Bertrand Russell, and David Hilbert, a group including philosopher Moritz Schlick, mathematician Hans Han, and social reformer Otto Neurath met weekly from 1924 to 1936, eventually joined by Kurt Gödel and Rudolf Carnap and deeply influenced by Ernst Mach, Ludwig Wittgenstein, and Karl Popper. Their bold collaborations led to logical empiricism, logical syntax of languages, the foundations of computer science, and the modern scientific method. University of Vienna mathematician and writer Karl Sigmund relates the story of this rich period in twentieth-century thought. The lively personal preface by Douglas Hofstadter is itself almost worth the book's price. Basic Books, 2017, 480 pp., $32.

INVESTIGATING GHOSTS: The Scientific Search for Spirits. Benjamin Radford. Ghosts have fascinated and haunted us forever, but scientific evidence for them is elusive. This new book by Ben Radford (SI's deputy editor and a CSI research fellow) is the first to examine the history and techniques of ghost hunting from folkloric, scientific, and sociocultural perspectives. It is based on nearly twenty years of his firsthand, science-based investigations and research. Topics include guidelines for scientifically investigating ghost reports, analyzing evidence from photographs and videos, the ghost-hunting equipment that amateurs too often rely on, in-depth case studies of solved "ghost" investigations, and the psychology of ghost experiences. An excellent follow-up to Radford's *Scientific Paranormal Investigation.* Rhombus Books, 2018, 320 pp., $19.99 paperback, $16.99 ebook.

—Kendrick Frazier

Following Disgraced Doctor Andrew Wakefield

ROBERT LADENDORF



The Pathological Optimist.
A film by Miranda Bailey.
Cold Iron Pictures. 2017.
93 minutes.

In her documentary about the disgraced doctor most identified as promoting the scientifically unproven claim that the measles, mumps, and rubella (MMR) vaccine causes autism, veteran filmmaker Miranda Bailey gives a human touch to Andrew Wakefield and tries to be neutral while framing the film with his attempt to bring a defamation lawsuit in Texas against English journalist Brian Deer. It was Deer who, in 2004, investigated Wakefield, finding conflicts of interest and ethical problems that helped lead in 2010 to Wakefield's dismissal as a doctor and a retraction of the original 1998 *Lancet* article coauthored by Wakefield with twelve others, most of whom retracted their support for the claim of the vaccine-autism link.

While her film crew followed Wakefield and his wife, Carmel, and two children for about five years in Texas, where the Wakefields had moved after Andrew lost his medical license in England and the *Lancet* article was retracted, Bailey nevertheless includes the arguments against his assertion, such as displaying onscreen text indicating that about 100 scientific studies show no vaccine-autism link.

Wakefield comes off as a soft-spoken but beleaguered family man trying to resurrect his reputation and raising money for his legal fund. Carmel is shown as perhaps his most outspoken defender, and there are a number of scenes of his ardent fans standing and cheering for him, including at a chiropractic forum. Other scenes show supporters encouraging Wakefield to keep fighting for his contention that vaccines should be given singly, not all at once, because they overwhelm the immune system.

It's hard to watch Wakefield's increasing despair after he proclaims his optimism on screen, compounded by the Texas appeals court rejecting his defamation lawsuit toward the end of the documentary. Deeply in debt despite some sizable legal fund donations, the Wakefields are shown selling off their real estate assets. To cope with his troubles, Wakefield is shown obsessively chopping wood with his axe and putting it in huge piles. It's a disturbing image to end the film.

In yet another eerie twist during the credits, Bailey includes a voicemail recording of someone telling her that making the documentary may damage her career. For free speech advocates, that comment can be construed as either helpful advice or a threat to the filmmaker.

Although the documentary provides newscasts and printed information on screen to relate the history of the Wakefield controversy, it spends the bulk of its time with Wakefield and his family. Bailey tries to make Wakefield less of a monster, and she has succeeded, but the fact remains that he is wrong.

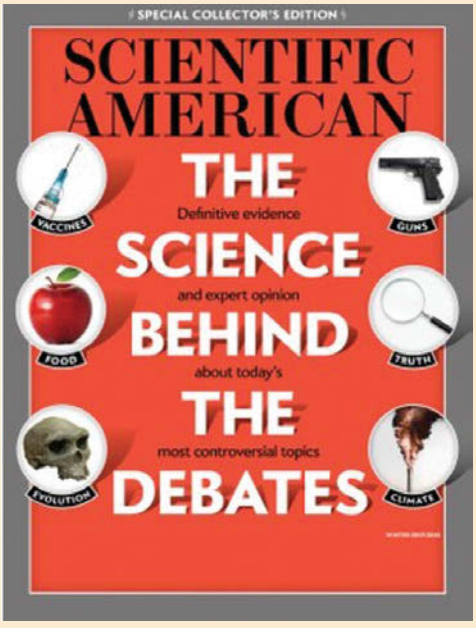
The documentary had its premiere in New York and Los Angeles last fall and was still being shown through March in a few cities around the country. It also is available on iTunes. For more information about the controversy, see the recent Skeptical Inquirer article by James Randi at https://www.csicop.org/si/show/the_dangerous_delusion_about_vaccines_and_autism.

After I watched the film in Santa Monica (at the only theater in Los Angeles showing it), I asked the other four attendees—all women—what they thought about the documentary and Wakefield's claim. One had an autistic child and, choking up, said that her son had fallen ill immediately after receiving the MMR vaccine and was never the same. All four supported Wakefield's claim. When I asked them about the screen's statement regarding the 100 studies showing no vaccine-autism link, one dismissed them, saying they were funded by pharmaceutical companies. That illustrates how difficult it is to change entrenched beliefs.

Both Wakefield and Bailey were there on the premiere night a few days before, but I found that no recordings or other information was left by them at the theater. ■

Robert Ladendorf is a freelance writer, former chief operating officer at the Center for Inquiry Los Angeles, and coauthor of an article on The Mad Gasser of Mattoon for Skeptical Inquirer. He also recently reviewed Michael E. Mann's book on climate change for this magazine.

Scientific American Collection on the Science about Controversial Issues



The Winter 2017/2018 "Special Collector's Edition" of *Scientific American* is devoted to "The Science Behind the Debates," subtitled, "Definitive evidence and expert opinion about today's most controversial topics."

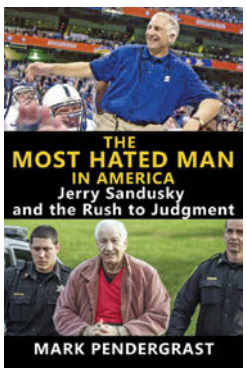
It's a collection of updated or adapted *Scientific American* articles and shorter pieces. It has sections on "Grappling with the Truth" (including "Post-Truth: A Guide for the Perplexed," "Why Good Thoughts Block Better Ones," and "Why People 'Fly from Facts'"), Climate, Vaccines, Guns, Food, and Evolution vs. Creationism.

Several CSI fellows are among the contributors, including Harriet Hall, Seth Shostak, Paul Offit, Naomi Oreskes, and Richard Dawkins (the latter on "Should Science Speak to Faith?").

In her brief introductory column "Science Lights the Way," *Scientific American's* Collections Editor Andrea Gawrylewski recounts examples where "scientific evidence has failed to convince" and notes that the collection "presents the science on some of the most contentious issues of our time." She adds: "The reader will quickly notice a common theme. For each topic, there really is no debate where the science is concerned." Although humans "let emotions get in the way of seeing the world for how it truly is," science can help us "by shining a light on facts in an uncertain universe, in uncertain times."

Reconsidering Monsters

JOSEPH R. STAINS



The Most Hated Man in America: Jerry Sandusky and the Rush to Judgment. By Mark Pendergrast. Mechanicsburg, PA: Sunberry Press, Inc. ISBN 1-62006-765-9. 391 pp. Paperback, $19.95.

"Jerry Sandusky is a monster, a serial pedophile!" is so deeply entrenched in the American psyche that it is virtually impossible to mention another view without arousing contempt or condescending pity. The only way to see the case through a fresh set of eyes would be a work by someone detached from all things Pennsylvania—a credentialed, disinterested investigator with a flair for thorough, balanced research and with an established track record of even-tempered integrity.

Mark Pendergrast has achieved that niche with *The Most Hated Man in America: Jerry Sandusky and the Rush to Judgment*, probably the most even-handed and thoroughly documented volume on the topic.

While much rhetoric and probing of the past six years took sides on the guilt or innocence of the Penn State University (PSU) football program *vis-à-vis* Sandusky's antics, virtually all presumed his guilt. Pendergrast's central focus is on the integrity of the case itself. From the earliest episodes in question through the police investigations and the trial, Pendergrast identifies each of the ten primary witnesses in the prosecution's case and examines the development of their claims.

At the outset, he focuses on a 2000 or 2001 episode of alleged abuse that took place in a shower. It was the largest source of national outrage and almost surely the incident most familiar to the public. Pendergrast affirms (as some others have) that the episode was grossly embellished by the grand jury presentment's author. Eyewitness Mike McQueary actually denied seeing any sexual contact between Sandusky and his alleged victim; in his first recounting, the night of the shower, he never articulated seeing any specific behavior—only hearing slapping sounds that he inferred were sexual. Both Sandusky and self-identified Victim 2 have independently denied sexual behavior that night and attributed the sounds to towel-slapping or slap-boxing. (The jury ultimately acquitted Sandusky of that rape charge.)

Contemporary investigation of a 1998 episode cleared Sandusky of wrongdoing based on firm testimony from the youth involved that nothing sexual had occurred. Pendergrast goes on to reveal conclusive evidence that the janitor in another alleged shower incident witnessed a perpetrator who was not in fact Sandusky.

Researching the background and police interviews of the remaining eight young men—not boys—who testified against Sandusky in the trial, Pendergrast verifies that many were recruited by police, initially denied any abuse, and relented only after being subjected to repressed-memory therapy and/or leading police interviews. The only two designated victims at trial who came forward on their own did so in response to the post-indictment appeal for more victims—by which time, Pendergrast suggests, financial motive may have become a factor. The book demonstrates internal contradictions in their accounts and other reasons to cast doubt on witness credibility in those cases.

Pendergrast chronicles the trial's daily proceedings in detail, noting Sandusky's strikingly naive choice of a small-town lawyer as his defense counsel, the ambient presumption of guilt in the jury pool, the willingness of the prosecution to present—and of the judge to accept—hearsay testimony for the janitor episode after the original witness had said in a taped police interview that Sandusky was not the perpetrator he saw.

In a case devoid of any physical evidence, Pendergrast's work boldly goes where almost no one has gone before—to suggest the fundamental innocence of Sandusky in the entire case.

Unlike attorney Louis Freeh, who presumed the guilt of both Sandusky and the PSU athletic staff—and was toasted and paid over $6 million by the university trustees for his conclusions

favoring their previous firings of two PSU leaders—Pendergrast takes us into adventurous territory at financial and reputational risk. Having followed the case closely and read scores of works on all sides of the issue, I find no one who has better prepared his case. Accept or reject the thesis of *The Most Hated Man in America*, but do not take it lightly. Pendergrast has done meticulous background work on every major player in the unfolding drama. And he provides material background for answering any question one may pose to him.

If Pendergrast has a dog in the fight, it is his rejection of repressed memory therapy, whose techniques, along with manipulative and misleading interview strategies by police, were used extensively in the counselling of several of the designated victims. This is his area of expertise (see his books *Memory Warp* and *The Repressed Memory Epidemic*), and when its use is in doubt in particular instances, he volunteers that truth. He concedes the sincerity of several of the witnesses while questioning the veracity of their claims.

The final chapters offer rarely published perspectives from Sandusky himself on the case and his personal experiences and conclusions from it. Noteworthy are the contrasts between the dossiers of nearly all convicted pedophiles and that of Sandusky—healthy, intimate marriage; immaculate police record into his fifties; drug-, alcohol-, and pornography-free lifestyle; a testosterone level too low to beget biological children of his own; a vocational schedule too preoccupied for the alleged innumerable trysts as claimed against him; unwavering insistence on his innocence; and repugnance toward sex crimes.

A rebuttal of the book's points and thesis will not be successful on a pedestrian level—the only level that has emerged so far. It should be required reading for courses in ethics and jurisprudence in every law school in America. In revealing the truth in the case, it may be well ahead of its time.

The Most Hated Man in America reminds us that the purpose of police investigation must be open-minded discovery of both incriminating and exculpatory facts and not the building of testimony toward presupposed guilt. Ethically sound prosecution has no place for redacting fictional grand jury testimony, for leaking of sensational details to the media before indictment, or for padding of witness testimony with hearsay and discredited therapy. It indicts the media's impulsive urge to publish sensational scenarios before analytical research of facts has been engaged—at risk to the reputations and very lives of innocent people, whatever the outcome. And as a cautionary word about societal prejudgment (see Richard Jewell, Duke Lacrosse, McMartin Preschool, and Lindy Chamberlain cases), it is an urgent appeal to sustain the under-practiced principle of innocent until proven guilty. ■

Joseph R. Stains is a graduate of Duke University (BA, MDiv) and a United Methodist clergyperson in western Pennsylvania. In his work, he has dealt with several cases of alleged molestation in community and youth program venues that were variously confirmed or dismissed.

LETTERS TO THE EDITOR]

A Skeptic's Guide to Racism

I am canceling my subscription to Skeptical Inquirer.

I want no more issues sent. I am specifically and solely canceling my subscription over the (special section) articles of the January/February 2018 issue ("A Skeptic's Guide to Racism: Critical Thinking on a Critical Issue").

One reason is I am not sure how a social topic (racism) and its link with politics in America could fit in this magazine. Also, another reason: the tone, flow, and angle of the articles were (am generalizing) one-sided and biased. There was a noticeable double standard in covering this topic.

I've enjoyed SI and have learned much. There have been some thought-provoking and deep articles. They caused me to think and I gained something.

But I'm standing by my decision on cancelling my subscription; I will not change it.

Benjie Bowlin

Southaven, Mississippi

The Editors respond:

We are not sure what the reader means by "one-sided coverage," as the topic was evidence-based approaches to understanding and confronting racism. If the reader has suggestions for other evidence-based approaches "from the other side" (whatever that would mean), we're happy to hear about them.

The features on racism (January/February 2018) are interesting, particularly that on educating law enforcement officers. Of course, neither the police nor anyone else should assume that just because a person belongs to a particular ethnic group they are more likely to commit crime. But I looked in vain for any acknowledgement of two important points arising from British experience.

Many years ago in Britain, controversy arose about the fact that here, as in America, the numbers of what we call BAME (Black and Minority Ethnic) people in prison were far greater, as a proportion of their total numbers in the population, than white people. And much more recently a black Labour MP, David Lammy, again raised the matter that such people feature very disproportionately in their involvement with the criminal justice system. But on neither occasion did anyone have the nerve to stick their head above the parapet and simply ask: "But isn't that because they commit more crime?" Terence Hines (p. 36)

says the assumption that African Americans have natural criminal tendencies is as nonsensical as astrology, and to say that all, or even most, do is, of course, ridiculous, but the indubitable fact is that some ethnic groups do commit considerably more crime than others, and this must surely be reflected in the figures.

The second unmentioned point is the danger of the opposite effect: that the police and other agencies may be afraid to proceed for reasons of misplaced political correctness and fear of being accused of racism. Britain has recently had several appalling cases of white girls being revoltingly sexually exploited by gangs of men, about whom social workers, the police, and others had many complaints but were reluctant to act because the men were of Asian origin and they were afraid of "rocking the boat." When the names of all the men eventually convicted in one such case were published, no one dared mention that all were obviously Asian. The men were known to have expressed the vilest contempt for white females, seeing them as garbage to be used and discarded, but they thought they could get away with it because they were protected by the authorities' fear of being accused of racism.

The white supremacists depicted in your feature are indeed utterly abhorrent, but these matters, too, should be considered.

Ray Ward
London, United Kingdom

I read with interest the articles discussing racism in America.

An interesting aspect of racism was made evident by the experience of my grandniece. Her mother is Caucasian and her father is African American. She appears to have a dark tan and, if one looks closely, slightly African facial features. She is an adult and a professional living on the East coast. Recently she went to the West coast on business where several people looked at her rather puzzled and asked if she were "black" or "white." They found her answer that she is "biracial" unacceptable and insisted that she must be one or the other.

This categorical view of race is similar to our view that politically one must be a Republican or Democrat and to say one is mixed is unacceptable and even to say one is Independent is considered questionable. The categorical view of race may have its historical roots in slavery, where black and white are separate castes, but may now be often genetically inaccurate. With the increasing percentage of our population being immigrants from around the world who are neither "black" nor "white," the categorical view of race may blur.

David Briggs
Marion, Massachusetts

The articles on racism are revealing in that they are black and white in two senses. First, the ideas of racism are confined to white folk being mean to black folk, and second that one is either a rabid racist or totally devoid of any such feelings. There is no dispute that white supremacists have treated the blacks very badly in the past and continue to do so, but there are instances of the inverse—blacks being mean to whites and of other races hitting on each other. There are many people who harbor opinions about other races that do not amount to racism but rather a recognition that different races have cultural differences that are not always to their liking.

Racism in America is entangled in the American myth, that they threw off the yoke of an oppressive monarch and then invented a democracy in which everyone is equal. Clearly not everyone is equal. We all have different capabilities and skills and all have different opinions about other races and cultures. That is normal. Only if these opinions develop into hate and aggression are they to be condemned.

Colin Gordon
Santa Barbara, California

I was excited to read the special section on racism and found the articles to be educational. Unfortunately, the most controversial theories on race were left untouched. Peggy McIntosh's invisible backpack idea needs a skeptical response. The ideas of white privilege and human rights have been confused and conflated. I have been told by my white, politically correct nephew that only white people can be racist and that all other races are just responding angrily to white racism. I told him that all people are equal and have equal capacities to both good and bad behavior, *including racism*. Ironically, in a world that has a great need of people to come together, McIntosh's ideas are divisive and tend to exasperate racism rather than reducing it. The word *racism*, which used to mean hate is now conflated to mean every possible negative interaction. To quote Rebecca Bradley: "This ideology assigns collective guilt, with no hope of absolution."

Gary McDermott
Chittenango, New York

I loved your article about [Stanford Professor of Psychology] Jennifer Eberhardt ("A Hard Look at How We See Race"), but I'm worried about some of her methods involving reaction times after viewing subliminal images. It is pretty much accepted within the skeptic community that subliminal images can't get you to buy more popcorn at the movies. So why should we accept uncritically their use to diagnose racial bias?

Don't get me wrong. I do indeed believe that many of us have racial biases that we are unaware of. I just worry that measuring these biases using tests of uncertain validity may end up doing more harm than good in the long run.

Steve Simon
Leawood, Kansas

Psychologist Stuart Vyse responds to Simon:

Although some priming effects have come under criticism lately, many subliminal priming effects are real and have been shown to appear in a variety of situations. But there is a difference between subliminally priming a simple association between guns and black faces (using visual images flashed on a screen), as Jennifer Eberhardt did in her research, and subliminally influencing people to get up out of their theater seats and buy popcorn. The research on commercial uses of subliminal priming shows weak effects, if any. Eberhardt's research had the simple goal of showing that people more easily make a mental association between crime-related stimuli and black faces than white ones. Nothing more, nothing less. Many previous studies have shown similar priming effects.

From the Editors:

We thank readers for their letters. As described in Ben Radford's introduction to the section, our focus was specifically on evidence-based approaches to reducing racism and prejudice, with emphasis on what recent published research in psychology and sociology has found. This has been a neglected aspect of the discussion. It is what made the topic relevant and appropriate for a magazine of science and reason. Many readers instead seemed to want to express their own ideas and opinions, but we did not—and could not—attempt to address the entire broad subject of racism and its causes and origins.

Not so SHARP?

I was reading the article by Tyler and Bakker suggesting the acronym SHARP to replace "skeptic" ("Let's Be SHARPs Together: The Need for a New Umbrella Term," January/February 2018). I particularly noted the claim that "SHARP is less arrogant and aggressive than *bright*, since its opposite is most comfortably blunt ... ." For obvious reasons, I have a lot of experience with antonyms for sharp, and blunt is rarely if ever used. By far the most common antonym is dull, with the musically inclined preferring flat. The authors are Australians, so perhaps usage is different Down Under, but at least in the United States, this would be as arrogant as *bright*, because *sharp*, to quote my handy dictionary, means "quick, acute or penetrating in perception or intellect." In addition, a meaning of "sharp" is as a variant of sharper, who is "a person, usually a gambler, dishonest in dealing with others; a trickster; a rogue; a swindler; a rascal." This is not

the message we wish to convey.

Dale Sharp
Peekskill, New York

Tyler and Bakker cannot be serious. Do they not recognize that "SHARP" is every bit as smug, ridiculous, arrogant, and cringe-inducing as "bright" was? Do they not realize that another common antonym for "sharp" is "dull," which is often used as a synonym for "stupid"? Do they not understand that they have cherry-picked words from their list to create a self-aggrandizing and condescending acronym?

And why a new term? It seems to me that the central concept here is empiricism—the provisional acceptance of claims based on solid scientific evidence and the non-acceptance of claims not so based. *Empiricism*/*empiricist*/*empirical* are clear, accurate, comprehensive words with no problematic baggage. Let us deep-six this SHARP idea before we all find ourselves reading *The SHARP Inquirer*.

Howard B. Parker
Salt Lake City, Utah

While I applaud the attempt to find a term for all who share these overlapping philosophies and views, I think "SHARP" is a bad idea.

Since the late '80s to early '90s, the term "SHARP" has been used by another group, for whom it means "Skin Heads Against Racial Prejudice." I'm glad those SHARPs disavow racism, but I don't want myself or "my" movement to be confused with them.

So, for now, I guess I will continue to identify myself as a skeptical secular humanist. Keep trying, though, guys; it would be useful to have an inoffensive term we could all use.

William Peckenpaugh
Pendleton, Oregon

The term SHARP is already taken. It stands for Skinheads Against Racial Prejudice and is a political movement that opposes neo-fasicm and other forms of racism. (One notable SHARP is the musician Pink.) I thought it was a bit myopic to propose SHARP as an umbrella term in the SI issue on racism without even mentioning that the term already exists to combat racism. People who agree with Tyler and Bakker might be willing to sign up for their cause but disagree with the SHARP political movement, and Tyler and Bakker have failed to inform their audience of the prior movement.

JonMichael Guy
Torrington, Wyoming

"SHARP" is yet another ludicrous attempt by an apparently very insecure subset of the smarty-pants skeptical community to come up with a snappy term to differentiate themselves from the "mundanes." The last such effort, if memory serves, was the loathsome and cringeworthy "Brights." Ugh.

That term was roundly, rightly, and reasonably condemned as "smug, ridiculous, and arrogant" (John Allen Paulos) and—as far as I can tell—died a pretty quick and deserved death.

SHARP, in my opinion, is arguably even more "smug, ridiculous, and arrogant" than "bright."

Peter Laird
Northampton, Massachusetts

Perhaps unfortunately, the article "Let's be SHARPs Together: The Need for a New Umbrella Term" reminded me of an episode of *The Simpsons* where Homer and friends form a barbershop quartet and then have to come up with a name for the group. The dialogue goes:

"We need a name that's witty at first but that seems less funny each time you hear it."

"How about 'The Be Sharps'?"

"Perfect."

Martin Stubbs
London, UK

David Tyler and Gary Bakker respond:

Whether "SHARP" is more or less arrogant than "bright" is a matter of opinion, but SHARP has the advantage of not being an entirely arbitrarily selected term. It is a fairly natural acronym (to repeat, it stands for Skeptics, Humanists, Atheists, Rationalists, and Positivists), which happens to have a positive connotation. If our efforts had resulted in the acronym IDIOT, I concede we would have tried harder to contort our labels, but SHARPs was a relatively easy and pleasing product.

We are not put off by other obscure or local meanings and associations such as a "sharper" being a trickster or the existence somewhere of a group called Skin Heads Against Racial Prejudice. The SHARP proposal is specifically meant to become an internationally recognized, widely used umbrella term. That is its very purpose. The Apple corporation does not rename its products in Uzbekistan because there is an Apple gravel quarry there. Any acronym will have other meanings somewhere.

The problem with empiricism *as an umbrella term is that many rationalists, atheists, and humanists argue against the supremacy of empiricism, and many who would call themselves empiricists are religious or "spiritual," or are more conspiracists than skeptics. In other words, empiricism does not encapsulate the two assumptions outlined in our article that the "community of reason" almost unanimously share.*

We can reassure Howard Parker that his dire premonition of being forced to read The SHARP Inquirer *is unlikely to come about. Where skeptical or humanist or atheist or similar communities, magazines, clubs, websites, or "in the Pubs" are strong, as in much of the United States, people are likely to defend their particular focus and preoccupations. It is where such organizations are struggling for critical mass that* The (insert name of country here) SHARP Thinker *may survive and even thrive. How much more likely is the survival of such a publication or organization in Pakistan than one with "atheist" in its title?*

Finally, though we enjoyed Martin Stubbs's reaction, SHARP is not meant to be witty, and we're happy for it to get less funny, and be taken more seriously, each time it is used.

Teach about Pseudoscience

Alejandro Borgo's suggestion that pseudoscience should be taught in college is not ambitious enough ("Why Pseudoscience Should be Taught in College," January/February 2018). We need to teach more and to younger students. We should create an age-appropriate series of materials that also teach propaganda techniques, common cognitive mistakes, statistics, magician's tricks, etc. And the material should be geared toward persuasion rather than simple instruction. Make the case for skepticism rather than just preaching what must be blindly accepted. But more important than the content of the instruction, we must find distribution methods that don't require fighting the religious and political forces that oppose a more skeptical population. We must explore ways to get our message directly to teenagers: a daily skeptical tip by email or Tweet, or a free, at-home lecture series delivered online or through the mail that parents can present to their teens. And we should seek endorsements and recommendations from celebrities loved by our target ages. What we're doing now clearly isn't working.

R. Allen Gilliam
Longwood, Florida

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words**. Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

The Take a Wish Foundation

By Ian Harris

As I write this we are a few days away from Friday the 13th, which makes me think about the whole concept of bad luck. Most of us laugh at that kind of stuff, but there are people out there who actually take it seriously and freak out if they break a mirror or won't walk under a ladder. I wonder: What do they think the mechanism behind the universal bad luck program is? There must be some sort of cause and effect, some sort of cosmic program responsible for the purveyance of bad luck.

Do they think there are a bunch of angry angels sitting up on a cloud somewhere just doling out unusually harsh punishments for ridiculously trivial crimes? How did they decide which crime gets which form of punishment? Was there a committee? How did they decide that seven years was the appropriate number of "bad luck years"? Do you think they found any irony in the fact that seven is often people's "lucky" number? Getting a lucky number of years of bad luck seems almost cruel. Why are these persnickety cherubs not worried about any real issues such as assault, murder, rape, and theft, yet they get hung up on things like crossing paths of black cats, walking under ladders, and where it is acceptable to open an umbrella?

Do they think there are a bunch of angry angels sitting up on a cloud somewhere just doling out unusually harsh punishments for ridiculously trivial crimes?

It reminds me of the positive thinking nonsense like *The Secret* and what they call The Law of Attraction. If you want something, all you need to do is think about it and concentrate on it, and it will manifest itself. Yes, the universe will grant it to you. If you want a relationship with your crush to happen, you just need to focus all your energy on it and the universe will make that relationship happen. Last I heard, concentrating and focusing all your energy on "making a relationship happen" is called stalking, and the only thing the universe will grant you is a restraining order.

Yet my whole life I always heard the opposite superstition: the jinx. You come back from a job interview that went well and say, "I think I'm gonna get that job." Then a friend always chimes in, "Whoa, Dude, don't jinx it!" Now what am I supposed to believe? That the universe is some sort of passive-aggressive, sadomasochistic, nut job that will reward you with all of your heart's desires if you just think about it, but the moment you speak of it out loud he's going to punish you for doing so? So, depending on how you play your cards, it goes from some sort of a cosmic Make a Wish Foundation to a cosmic Take a Wish Foundation? It all seems so petty, random, and useless. Who runs this program? Corporate America? Oh well, at least the HR Department has a place to go when they die.

Ian Harris is a professional stand-up comedian who infuses skepticism and science into his comedy. His hour-long TV special *ExtraOrdinary* is currently available on most video on-demand platforms.

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The organizations listed above have aims similar to those of the Committee for Skeptical Inquiry but are independent and autonomous. Representatives of these organizations cannot speak on behalf of CSI. Please send updates to Barry Karr, P.O. Box 703, Amherst NY 14226-0703.
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